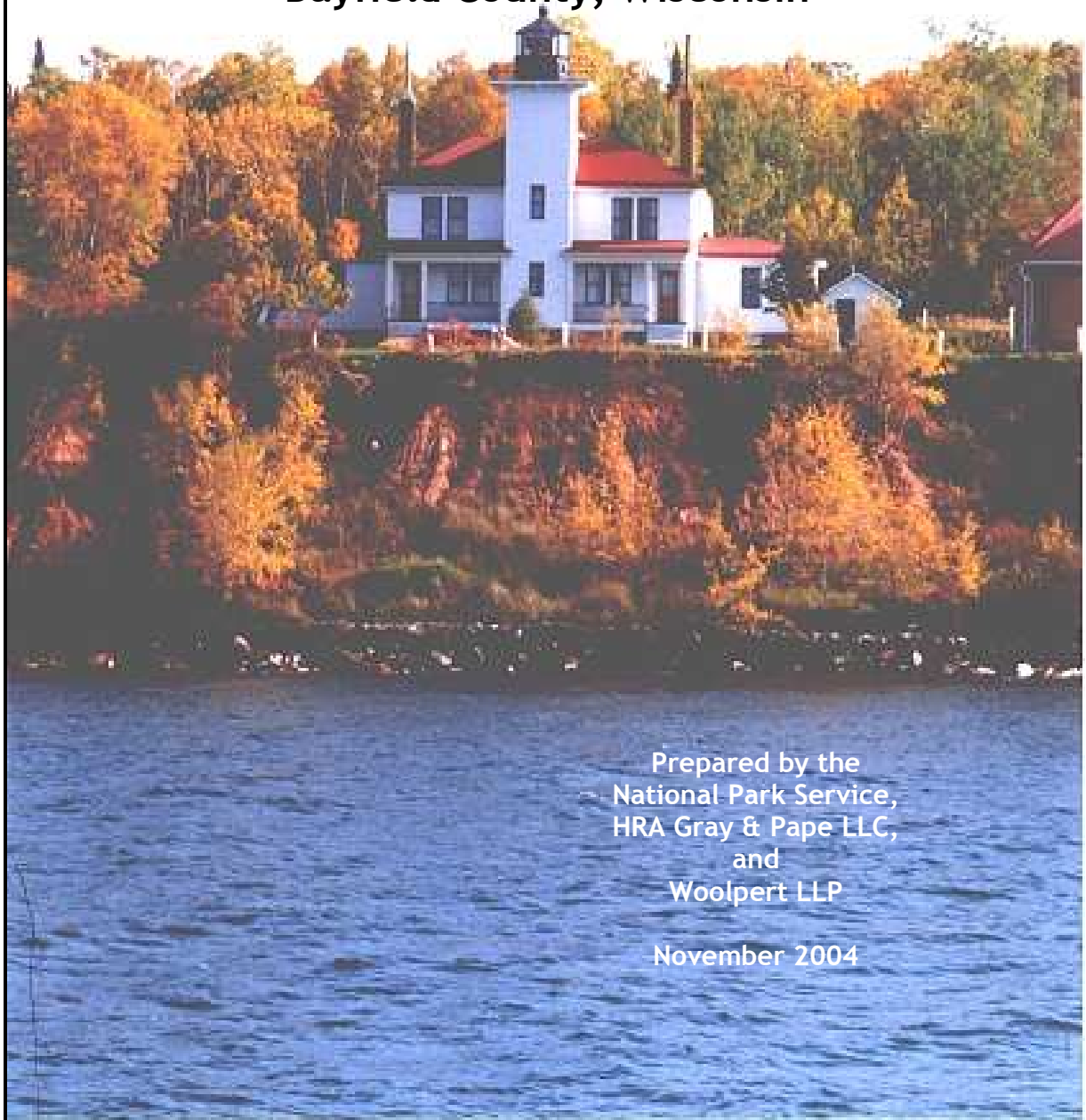


**Cultural Landscape Report  
and Environmental Assessment  
Raspberry Island Light Station  
Apostle Islands National Lakeshore  
Bayfield County, Wisconsin**



Prepared by the  
National Park Service,  
HRA Gray & Pape LLC,  
and  
Woolpert LLP

November 2004





**Cultural Landscape Report  
and Environmental Assessment  
Raspberry Island Light Station**

**Apostle Islands National Lakeshore  
Bayfield County, Wisconsin**

**Prepared by**

**National Park Service**

**Research and Treatment Recommendations by Apostle Islands National Lakeshore,  
Editing by Midwest Regional Office, Cultural Resources Division, and  
Graphics Editing and Project Management by the Denver Service Center**

**and**

**HRA Gray & Pape LLC**

**Woolpert LLP**

**Analysis and Evaluation, Treatment Recommendations, and Document Preparation**

# Table of Contents

<b>Part I .....</b>	<b>1</b>
<b>Chapter 1: Introduction .....</b>	<b>1</b>
Management Summary .....	1
Historical Summary .....	3
Scope of Work and Methodology.....	5
Study Boundaries.....	9
Summary of Findings .....	13
Treatment Alternatives .....	13
<b>Chapter 2: Site History.....</b>	<b>15</b>
Regional Economic Development and the Growth of Lake Superior Shipping.....	15
Initial Construction and Operation of the Raspberry Island Light Station: 1859 to 1901 .....	21
Expansion of Station Facilities: 1902-1938 .....	37
Coast Guard Manning and Operation of Raspberry Island Light Station: 1939-1947 .....	60
Abandonment and Rehabilitation: 1948-1974.....	62
National Park Service Management: 1975-2003.....	64
<b>Chapter 3: Existing Conditions .....</b>	<b>75</b>
Natural Systems and Features .....	75
Spatial Organization .....	75
Land Use.....	76
Circulation.....	76
Topography .....	79
Buildings and Structures .....	81
Raspberry Island Lighthouse and Keeper's Quarters (#08103A, LCS 006390) .....	81
Fog Signal Building (#09102B, LCS 006392) .....	82
Oil Building (#08102H, LCS 006375) .....	83
Barn (#08102C, LCS 006393) .....	83
Shed #1 (#08102G, LCS 006374).....	84
Keeper's Privy (#08102E, LCS 006395) .....	85
Shed #2 (#08102F, LCS 006396) .....	85
Assistant Keepers' Privy (#08102D, LCS 006394).....	86
Water Tank and Solar Shower .....	86
Boathouse (#08102K, LCS 101623) .....	86
Dock (#08102A, LCS 006391).....	87
Steps and Tramway (#08104B, LCS 101624) .....	88
Vegetation .....	88
Views and Vistas .....	90
Small Scale Features.....	92
Walks (#08104A, LCS 101630) .....	93
Light Beacon.....	93
Cistern (#08104C, LCS 101628) .....	94
Flagstaff.....	94
Concrete Oil Cradles (#08104E, LCS 101627) .....	94
Drainage Trough .....	94
Grape Arbor.....	95
Pole Supports .....	95
Swing.....	96

Clothesline .....	96
Weather Station.....	97
Bird House.....	97
Range Marker .....	97
Interpretive Signage .....	98
Pit Toilets .....	98
Archeological Features .....	99
Root House .....	99
Plank Walks.....	99
<b>Chapter 4: Landscape Analysis and Evaluation.....</b>	<b>101</b>
Introduction.....	101
Statement of Significance .....	101
Natural Systems and Features .....	102
Spatial Organization .....	107
Land Uses and Activities .....	109
Circulation Networks.....	110
Points of Access.....	110
Trails .....	111
Pedestrian Paths: Concrete (#08104A, LCS 101630), Plank and Cinder Walkways.....	112
Summary .....	113
Buildings and Structures .....	113
Station Lighthouse and Keeper's Quarters (#08103A, LCS 006390).....	113
Fog Signal Building (#08102B, LCS 006392) .....	114
Oil Building (#08102H, LCS 006375) .....	115
Barn (#08102C, LCS 006393) .....	115
Shed #1 (#08102G, LCS 006374).....	116
Keeper's Privy (#08102E, LCS 006395) .....	116
Shed #2 (#08102F, LCS 006396) .....	116
Assistant Keepers' Privy (#08102D, LCS 006394).....	116
Water Tank & Solar Shower.....	116
Boathouse (#08102K, LCS 101623) .....	116
Dock (#08102A, LCS 006391) .....	117
Steps and Tramway (#08104B, LCS 101624) .....	117
Summary .....	117
Vegetation .....	118
Gardens and Plantings .....	118
Lawn.....	127
Edible Perennials .....	128
Invasives.....	129
Field Crops .....	129
Clearing .....	130
Summary .....	131
Small-Scale Features .....	132
Walks (#09104A, LCS 101630) .....	135
Light Beacon.....	135
Cistern (#08104C, LCS 101628) .....	135
Flagstaff.....	136
Birdbath.....	136
Concrete Oil Cradles (#08104E, LCS 101627) .....	136
Drainage Trough .....	136

Grape Arbor.....	137
Flagstaff Pole Supports .....	137
Swing.....	138
Clothesline.....	139
Lighthouse Yard Fence .....	139
Weather Station.....	141
Birdhouses .....	141
Range Marker .....	142
Interpretive Signage .....	142
Picnic Tables.....	142
Pit Toilets .....	142
Summary .....	142
Archaeological Features.....	147
<b>Part II.....</b>	<b>149</b>
<b>Chapter 5: Treatment.....</b>	<b>149</b>
Introduction.....	149
Landscape Character.....	149
Management Philosophy.....	150
Management Zones.....	150
Zone I .....	151
Zone II .....	151
Zone III.....	151
Recommended Treatment .....	151
Zone I: Lighthouse Yard .....	151
Zone II: Clearing.....	153
Zone III: Forest .....	154
Alternatives for Treatment .....	155
Alternative I.....	155
Alternative I: Evaluation .....	156
Alternative II.....	159
Alternative II: Evaluation .....	160
Alternative III .....	165
Alternative III: Evaluation.....	166
Proposed Actions: Lighthouse Yard – Alternatives II and III.....	170
Fence .....	170
Flagstaff.....	170
Birdbath.....	171
Swing.....	171
Range Marker .....	171
Vegetable Garden.....	172
Cinder Path .....	177
Cement Walkways .....	177
Soil Analysis.....	177
Damaged Vegetation .....	177
Grape Arbor.....	178
Archeological Features.....	178
Proposed Actions: Clearing.....	178
Trails .....	178
Alternative I.....	178

Alternative II.....	179
Alternative III .....	179
<b>Chapter 6: Bibliography .....</b>	<b>185</b>
Drawings .....	188
Web Sites .....	188
For Further Reading and Research .....	189

## Appendix: Environmental Assessment, Raspberry Island Light Station

### List of Figures

Figure 1. Location map.....	2
Figure 2. Utilities site plan (provided by ARCADIS). .....	7
Figure 3. Site map. ....	11
Figure 4. 1856 navigation channel map.....	20
Figure 5. View to northeast of lighthouse, ca. 1890. Note board fence to right, rear. The woman appears to be standing on a plank walkway (Lakeshore archives). ....	23
Figure 6. 1877 site map. Light station clearing at southwest tip of island.....	24
Figure 7. Lighthouse, dock, and boathouse, ca. 1901. Note storm shed on lighthouse entry; small size of dock and boathouse; stairs to bluff, swing to right of lighthouse; and board fence at far right (Lakeshore archives). ....	25
Figure 8. View to northeast of lighthouse, ca. 1890. Note board fence visible to left and right of building; plank walkway at front and side of building; and apparent absence of outbuildings behind lighthouse (Lakeshore archives). ....	27
Figure 9. View of lighthouse and station clearing from lake, ca. 1891. Note fence surrounding lighthouse yard and extent of station clearing (Lakeshore archives). ....	28
Figure 10. Detail of Figure 9. Note stairs from dock to bluff; fence around yard; absence of a boathouse; and the outbuilding visible at right of lighthouse (Lakeshore archives).....	28
Figure 11. Leisure activity in front (west) of lighthouse, ca. 1901. Note wire fence in background; storm shed on lighthouse entry; and unmown "lawn." The function of the structure behind the woman kicking the ball is unknown (Lakeshore archives).....	29
Figure 12. Cutting wood in the surrounding forest, ca. 1906. View to south. Note wheelbarrow used to haul wood; remodeled lighthouse in rear (Lakeshore archives). ....	34
Figure 13. Raspberry Island Historic Base Map: 1859-1901.....	35
Figure 14. View to south of lighthouse and fog signal building, ca. 1903. Note access to cellar beneath kitchen wing at left (Lakeshore archives).....	38
Figure 15. View to southwest of fog signal cistern, date unknown. Note hand pump; boxed-in waterline between cistern and fog signal building; and wood tramway at rear (Lakeshore archives). ....	39
Figure 16. View to northeast of lighthouse, ca. 1906. Photo taken shortly after completion of remodeling. Note concrete walks; keeper's privy just visible at right rear (Lakeshore archives). ....	41
Figure 17. View of station outbuildings, date unknown. From left to right: assistant keeper's privy (just visible); shed #2; keeper's privy, shed #1, and barn. Note stove pipe projecting from roof of shed #1; clothesline to rear of outbuildings; apparent wire yard fence; and absence of obvious paths and walks (Lakeshore archives). ....	42

Figure 18. View to north of horse in vegetable garden, date unknown. This garden appears to be in the approximate location of the reconstructed vegetable garden, south and east of the lighthouse (Lakeshore archives). .....	43
Figure 19. View to north of gardens, August 1922. Note vegetable garden to right; cinder path leading to barn in foreground; and flower beds bordered with painted stones (Lakeshore archives). .....	44
Figure 20. View from lake, ca. 1906. Note wood tramway at right; apparent wire fence (white-painted fence posts); and sewer/drainage lines on bluff face to left of lighthouse and below fog signal building. Outbuildings are visible to the rear of the lighthouse and fog signal building (Lakeshore archives). .....	45
Figure 21. Rear (east) façade of lighthouse, ca. 1906. View taken after completion of remodeling. Note simple flagstaff in front (west) of lighthouse; concrete walkways; and wire yard fence gate. The tree behind the lighthouse and the two large rocks beside the walkway are no longer extant (Lakeshore archives). .....	46
Figure 22. View to north of front (west) lawn of lighthouse, ca. 1920s. Note height of concrete walkway above grass; wire yard fence (painted cedar posts); and flower beds. This view shows the beds before they were bordered with painted stones (Lakeshore archives). .....	47
Figure 23. Harold Benton (son of Keeper Lee Benton) in front (west) of shed #2, ca. 1920. Note cement walk high above surrounding grass; plank walkway leading to assistant keeper's privy and alongside shed #2 to clothesline area; wire yard fence; and extent of station clearing beyond the fence (Lakeshore archives). .....	48
Figure 24. View to north of gardens, August 1922. Note flagstaff with topmast and gaff; flower beds outlined with painted stones; cinder path to barn in foreground; vegetable garden to right; and swing behind vegetable garden (Lakeshore archives). .....	48
Figure 25. Playing on the swing, ca. 1904. View to east. Note the assistant keepers' privy and shed #2 to the rear; the old woodshed behind shed #2; and the plank walkways (Lakeshore archives). .....	49
Figure 26. View of swing, ca. 1924. Note the apparent height of the swing; the woodshed, keeper's privy, and "shack" to the rear; and the concrete walkways (Lakeshore archives). .....	49
Figure 27. Flower gardens. View to north, ca. 1922. Note painted stone borders and foundation plantings against the lighthouse (Lakeshore archives). .....	50
Figure 28. View to north of flower gardens at southwest corner of lighthouse, ca. 1920. Compare with Figure 22. Foundation bed border appears to be brick placed on end. Plantings appear to include astilbe, nasturtium, and dahlias (Lakeshore archives). .....	51
Figure 29. View from lake, ca. 1936. Note flagstaff to rear (east) of fog signal building (Lakeshore archives). .....	52
Figure 30. Hauling equipment for refitting of fog signal, ca. 1932. Note I-beam on front (west) façade of building, added in 1925 (Lakeshore archives). .....	53
Figure 31. View to west of fog signal building, ca. 1945. Note fuel oil tanks flanking oil building; and flagstaff/aerial mast (Lakeshore archives). .....	54
Figure 32. Raspberry Island Historic Base Map: 1901-1947. ....	55
Figure 33. View from lake, ca. 1936. Note flagstaff with topmast, and range marker at right (Lakeshore archives). .....	57
Figure 34. View to northeast of lighthouse, ca. 1936. Note screened porches and mountain ash directly west of light tower (Lakeshore archives). .....	57
Figure 35. View to southeast of family group, ca. 1936. Note birdbath; wire yard fence at rear; range markers behind yard fence between barn and fog signal building and at extreme right. The open area between the buildings may be the vegetable garden (Lakeshore archives). .....	58
Figure 36. Aerial view to east of the station, ca. 1940. Note the extent of the clearing; wire yard fence; flagstaff with topmast; birdbath to south of flagstaff; clothesline behind outbuildings; birdhouse to	

south of barn; range markers at far right; flower garden and station name on bluff below fog signal building; fuel oil tank at southeast corner of fog signal building; and equipment and material at southwest corner of yard (Lakeshore archives). .....	59
Figure 37. Aerial view to north of the station, ca. 1940. Compare with Figure 36. Note garden patch in front (west) of barn; and flagstaff or aerial mast, with supports, west of garden plot (Lakeshore archives). .....	60
Figure 38. Keeper Alva Carpenter picnicking in the lighthouse yard with family and friends, ca. 1942. Note picnic table and reel for fishing net (Lakeshore archives). .....	61
Figure 39. Keeper Alva Carpenter's garden, ca. 1944. View to north. Note L-shaped plan of plot and north-south orientation of furrows. Also note, in background, swing; wire yard fence; and birdhouse (Lakeshore archives). .....	61
Figure 40. U.S. Coast Guard Navigation beacon, view to north, ca. 2000. ....	63
Figure 41. View to east from lake, ca. 1970s. Note encroachment of vegetation into station clearing and erosion of bluff. Compare to Figure 7 (Lakeshore archives). ....	64
Figure 42. Raspberry Island Historic Base Map: 1948-1974. ....	65
Figure 43. Boathouse and dock. View to east, 1977 (Lakeshore archives). ....	67
Figure 44. National Park Service interpretive signs. View to northwest, 2003. ....	68
Figure 45. Reconstructed flowerbed. View to south, ca. 1984 (Lakeshore archives). ....	69
Figure 46. Reconstructed vegetable garden. View to southeast, 1984. Note potato patch south of barn (Lakeshore archives). ....	69
Figure 47. Construction of water tank, ca. 1982 (Lakeshore archives). ....	70
Figure 48. View to northeast of bank erosion, May 2001(Lakeshore archives). ....	71
Figure 49. Bank erosion detail. View to north, May 2001(Lakeshore archives). ....	72
Figure 50. Revetment construction. End of first construction season, 2002. ....	72
Figure 51. Top of slope at end of first construction season. View to northwest, 2002. Note U.S. Coast Guard beacon and fog signal cistern. ....	73
Figure 52. Map of existing conditions. ....	77
Figure 53. Sand spit. View to north, 2003. ....	79
Figure 54. Approximate locations of existing trails. ....	80
Figure 55. West façade of lighthouse, 1988 (Lakeshore archives). ....	81
Figure 56. Damaged siding. North façade of lighthouse, 2003. ....	82
Figure 57. West (front) and north facades of fog signal building, 2003. ....	83
Figure 58. Side and front (west) facades of oil building, 2003. Note concrete tank cradles north of building. ....	83
Figure 59. Front (west) and south facades of barn, 2003. ....	84
Figure 60. Side and front (west) facades of Shed #1, 2003. ....	84
Figure 61. Side and front (west) facades of keeper's privy, 2003. ....	85
Figure 62. Front (west) and south facades of Shed #2, 2003. Note deterioration of board and batten siding at the base of the building due to poor drainage. ....	85
Figure 63. Front (west) and south facades of assistant keepers' privy, 2003. ....	86
Figure 64. North facade of water tank and solar shower, 2003. ....	86
Figure 65. Front (west) and south facades of boathouse, 2003. ....	87
Figure 66. View to northwest of dock cribs, 2003. ....	87
Figure 67. Steps and tramway. View to east, 2003. ....	88
Figure 68. View to south from lighthouse, 2003. ....	90
Figure 69. View to north from clearing, 2003. ....	91

Figure 70. View to northeast showing extant of clearing and condition of bluff, ca. 1932-1944 (Lakeshore archives).	91
Figure 71. View to east from lake, 2003.	92
Figure 72. Concrete path leading to rear of lighthouse. View to northeast, 2003.	93
Figure 73. Concrete path from keeper's privy to shed #1. View to south, 2003.	93
Figure 74. Cistern. View to southeast, 2003.	94
Figure 75. Concrete oil cradles. View to northwest, 2003.	94
Figure 76. Drainage trough and cement walkways. View to north, 2003.	95
Figure 77. Grape arbor and pole supports. View to east, 2003.	95
Figure 78. Swing. View to northwest, 2003.	96
Figure 79. Clothesline. View to north, 2003.	96
Figure 80. Weather Station. View to west, 2003.	97
Figure 81. Bird House. View to east, 2003.	97
Figure 82. Range marker. View to west, 2003.	98
Figure 83. Remnant of plank walkway. View to southwest, 2003.	99
Figure 84. 1910 site map showing topography. Note location of yard fence and extent of clearing.	103
Figure 85. Current topography map.	104
Figure 86. Change in shoreline and bluff. Comparison of 1910 map with ca. 1990s aerial photograph.	105
Figure 87. Bluff conditions. View to northeast, post-1932 (Lakeshore archives).	106
Figure 88. Bluff conditions, 1977 (Lakeshore archives).	106
Figure 89. Aerial view to northeast, 1983 (Lakeshore archives).	108
Figure 90. Aerial view to east, ca. 1995. Note extent of the forests encroachment into the clearing compared with Figures 36 and 37 (Lakeshore archives).	108
Figure 91. Aerial view to east, 2002 (Lakeshore archives).	109
Figure 92. Aerial view ca. 1940. Note faint trail leading into woods at upper edge of photograph (Lakeshore archives).	111
Figure 93. Cinder path location, ca. 1940. Also note walkway between shed #1 and barn (Lakeshore archives).	112
Figure 94. Lighthouse and fog signal building ca. 1920. View to southeast. Note height and character of lawn (Lakeshore archives).	114
Figure 95. View to southeast of fog signal building, 2003.	114
Figure 96. Contemporary view to southeast of building cluster (left to right: keeper's privy, shed #1, barn), from lighthouse tower, 2003. Compare to Figure 17. Note clothesline behind (east) of buildings, propane tank in clearing east of barn, reconstructed birdhouse south of barn, vegetable garden plot, and non-historic grape arbor west of vegetable garden.	115
Figure 97. Dock and boathouse. View to southwest, 1936 (Lakeshore archives).	117
Figure 98. Historic garden locations as indicated on 1910 site map.	120
Figure 99. Garden Plan (date unknown) representing 1922 conditions (Lakeshore archives).	121
Figure 100. Historic location of vegetable garden, ca. 1940 (Lakeshore archives).	122
Figure 101. View to south of gardens, ca. 1980s. Compare spacing between plots with Figure 102. Note east-west furrows in vegetable garden and flag pole supports (Lakeshore archives).	122
Figure 102. Cobbled beds, ca 1982 reconstruction (Lakeshore archives).	124
Figure 103. Daylilies in foundation beds at west side of lighthouse (Lakeshore archives).	125
Figure 104. Garden beds south of lighthouse, ca. 1922. Iris are located at the center of the bed. Shrubs – roses, currants or gooseberries – anchor either end of the long flowerbed (Lakeshore archives).	125



Figure 105. View to northeast showing front yard of lighthouse ca. 1920s showing mountain ash and lilac. Note white blossoms on lilac and dimensions that suggest a hedge of lilac. Bedding plantings are visible at the northwest corner of the lighthouse. Wood post and wire fence is visible along north edge of lighthouse yard (Lakeshore archives). Compare with Figure 11, which shows the beginnings of a hedge planted ca 1900. ....	126
Figure 106. Injured mountain ash ( <i>Sorbus</i> ). View to north, 2003. ....	127
Figure 107. Damaged mountain ash ( <i>Sorbus</i> ). View to west 2002. ....	127
Figure 108. Hayride, ca. 1926. Note post and wire fence (Lakeshore archives). ....	129
Figure 109. Dimensions of historic agriculture area of approximately 2.5 acres. ....	130
Figure 110. Aerial view, ca. 1940s showing vegetative buffer in clearing (Lakeshore archives). ....	132
Figure 111. Canopy and cover. ....	133
Figure 112. Historic view of cement walks, ca. 1920s (Lakeshore archives). ....	135
Figure 113. Historic flagstaff locations, ca. 1940 (Lakeshore archives). ....	136
Figure 114. View to east of pole supports (left of barn), 2003. Compare to Figure 31. ....	137
Figure 115. Historic view to north, ca. 1922. Note height of swing marked in red (Lakeshore archives). ....	138
Figure 116. View to northwest of yard, 2003. Note reconstructed swing (to left of barn) and compare height of feature with height in Figure 117. ....	138
Figure 117. Clothesline. View to north, 2003. ....	139
Figure 118. Detail of Figure 36, showing location of fence gates, ca. 1940 (Lakeshore archives). ....	140
Figure 119. Detail of Figure 36, showing location of fence gate, ca. 1940 (Lakeshore archives). ....	140
Figure 120. Birdhouse locations, ca. 1940 (Lakeshore archives). ....	141
Figure 121. Birdhouse location, ca. 1944 (Lakeshore archives). ....	141
Figure 122. Birdhouse in foreground to left of barn, 2003. ....	142
Figure 123. Base map of existing conditions. ....	145
Figure 124. Remnants of wood walkway to assistant keepers' privy. View to southwest, 2003. ....	147
Figure 125. Zone Diagram. ....	152
Figure 126. Forest in relationship to light station clearing. ....	154
Figure 127. Alternative I. ....	157
Figure 128. Alternative II. ....	161
Figure 129. Planting plan. ....	163
Figure 130. Alternative III. ....	167
Figure 131. Limits for replacement of western flagstaff and birdbath (Lakeshore archives). ....	170
Figure 132. Detail of Figure 34 showing size of birdbath. Feature approximately 2'6" tall x 1'6" in diameter (Lakeshore archives). ....	171
Figure 133. Range marker locations, ca. 1936 (Lakeshore archives). ....	172
Figure 134. Detail of garden plot location, ca. 1940 (Lakeshore archives). ....	173
Figure 135. Planting plan. ....	175
Figure 136. Cinder path and garden placement (Lakeshore archives). ....	177
Figure 137. Root house. ....	179

## List of Tables

Table 1. Contributing Resources Identified in National Historic Landmark Nomination .....	10
Table 2. Vegetable Garden Crops from Period of Significance. ....	123
Table 3. Historic Ornamental Vegetation – Raspberry Island Light Station. ....	124
Table 4. Historic Edible Perennials Identified at Raspberry Island .....	128
Table 5. Historic Field Crops. ....	129
Table 6. Small-Scale Features at Raspberry Island .....	143
Table 7. Treatment Option Matrix .....	170
Table 8. Vegetable Garden Crops .....	173
Table 9. Flower Garden/Ornamental Plantings.....	174
Table 10. Native Species Present .....	181
Table 11. Native Species Present But Not Endemic of Native Prairie .....	183

## Part I

### Chapter 1: Introduction

#### Management Summary

Raspberry Island Light Station is one of six light stations located within Apostle Islands National Lakeshore (the Lakeshore). The park, located at the northeast point of the Bayfield Peninsula in Bayfield County Wisconsin, encompasses most of Lake Superior's Apostle Islands Archipelago, as well as a portion of the mainland (Figure 1). At roughly 296 acres, Raspberry Island is one of the smaller islands in the archipelago. Originally operated under the auspices of the U.S. Lighthouse Service, and then the U.S. Coast Guard, the Raspberry Island light station came under managerial control of the National Park Service in 1975, nearly five years after passage of Public Law 91-424, which established the Lakeshore.

The enabling legislation for the park charges the National Park Service with conserving and developing the historical resources located on its lands, for "inspiration, education, recreational use, and public enjoyment." <sup>1</sup> The legislation states specifically that historic resources within the lakeshore will be preserved. To that end, the park has undertaken stabilization projects at several light stations, as well as general contextual studies concerning the importance of Great Lakes light stations to the regional shipping industry and economy. Previous work completed at Raspberry Island has included stabilization of the lighthouse and reconstruction of the station's ornamental flowerbeds. Recently, the Lakeshore contracted for completion of a historic structures report for the lighthouse, which contains various alternatives for rehabilitation of this significant building.

Although previous studies have provided excellent information regarding the evolution of the site's buildings and structures and its native and introduced vegetation, they have not analyzed the relationship of the built environment to the remainder of the island, nor have they documented, analyzed, and evaluated the relationships between all the various buildings and structures extant at the light station and the surrounding environment. This cultural landscape report (CLR) employs a holistic approach to the analysis of the historic site, identifying general landscape characteristics and associated features that define the historical character of the property.

The CLR is intended to serve two important functions. It will serve as the principal treatment document for cultural landscapes at Raspberry Island and will also serve as the primary tool for long-term management of those landscapes. The CLR establishes preservation goals for the cultural landscape that are grounded in research, inventory, documentation, and analysis and evaluation of the landscape's characteristics and associated features. It provides the basis for making sound decisions about management, treatment, and use.<sup>2</sup>

---

<sup>1</sup> Public Law 91-424: 16 U.S.C. 460w; 84 Stat. 880.

<sup>2</sup> Robert R. Page, Cathy A. Gilbert, and Susan A. Dolan, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Washington, DC: National Park Service, 1998), 3-4.

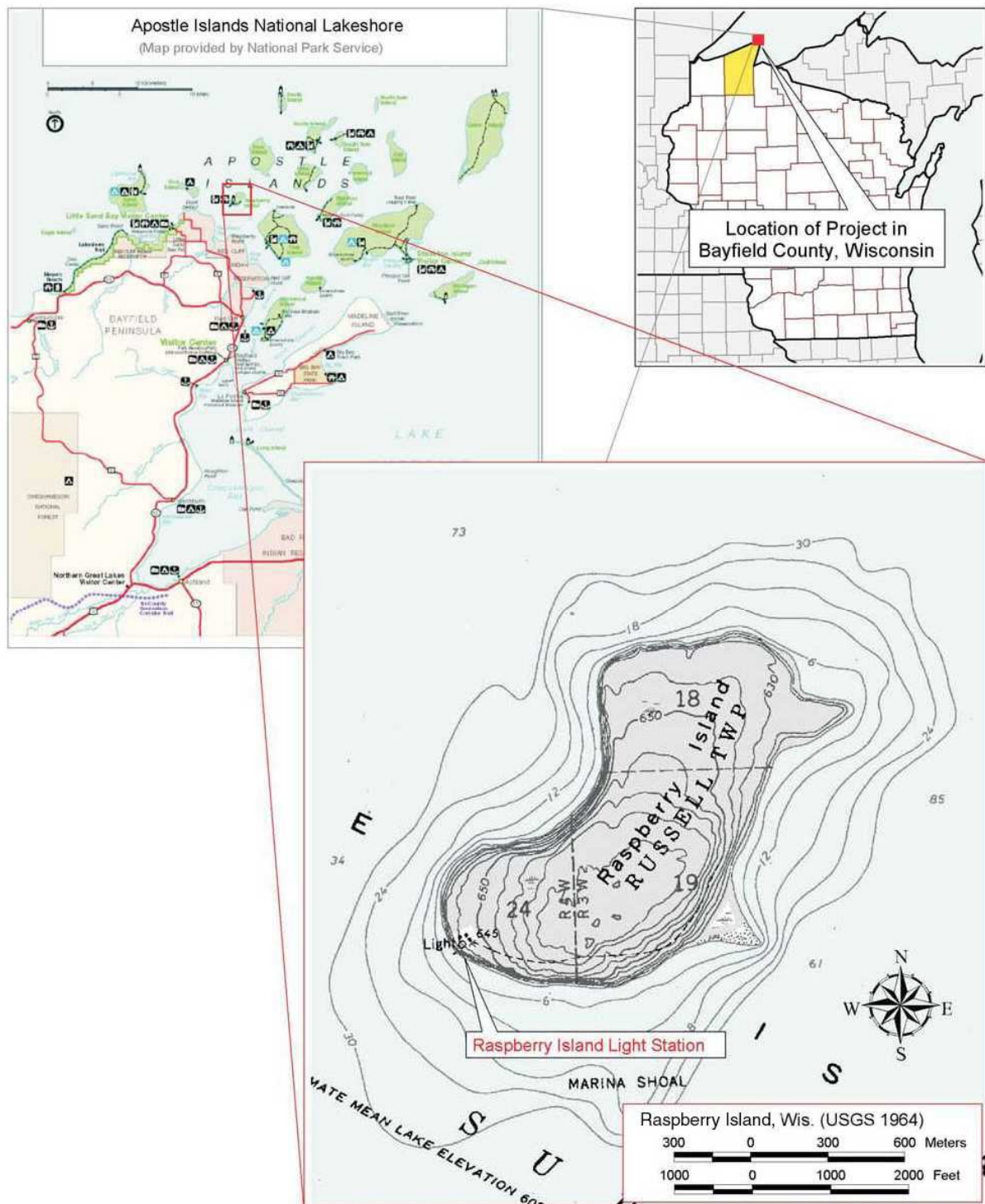


Figure 1. Location map.

## Historical Summary

The six light stations located on the Apostle Islands in Lake Superior have been called "the largest and finest collection of lighthouses" in the United States.<sup>3</sup> The nine extant lights, and the ruins of a tenth, exemplify the evolution of American lighthouse design during the second half of the nineteenth century. They are also closely associated with the nationally significant development of maritime commerce on the Great Lakes. In 1855, just prior to construction of the first of the Apostle Island light stations, Great Lakes commercial shipping was valued at \$600 million, more than the entire foreign trade of the nation. By the 1890s 80 percent of all maritime freight tonnage moved in the United States passed through the navigation locks at Sault Ste. Marie, and much of that traffic traveled past the Apostle Island lights on its way to and from the ports of Duluth and Superior at the western end of Lake Superior. The Apostle Island lights were essential navigational aids for this traffic.<sup>4</sup>

In 1859 President James Buchanan reserved all of Raspberry Island for the exclusive use of the United States Lighthouse Board, the federal entity charged with providing navigational aids to enhance shipping commerce. Raspberry Island Light Station was completed and ready for occupancy in 1862, but did not actually begin operating until 1863. Initial development consisted of cutting trees from a six-acre clearing atop a bluff on the southwest edge of the island and construction of a dock and boat house at "the sand point", a sheltered landing site at the southeastern corner of the island, about three-quarters of a mile from the station clearing. Construction materials were hauled from the landing to the clearing along a path cut through the woods. By 1868, the Lighthouse Board had built a boat landing directly below the lighthouse yard. A wood stairway connecting the dock to the top of the bluff, facilitating movement of people and some supplies, was authorized in 1868 but not built until 1873. Even after completion of the stairs, heavy supplies and livestock continued to be loaded and off-loaded at the landing at the sand point.<sup>5</sup> For nearly the next forty years, the Raspberry Island Light Station experienced little change in its physical plant, with the exception of a few small-scale improvements added to the site.

Throughout this initial period of development and use, the keepers stationed at Raspberry Island maintained the clearing and the trail to the sand point. Keepers were free to utilize the clearing for purposes that did not interfere with operation of the navigational aids, and several apparently harvested hay from the clearing for their own use or for sale. In addition, keepers established flower and vegetable gardens and kept small quantities of livestock, including chickens, cows, and horses.

In 1902, planning for the addition of a fog signal at Raspberry Island engendered a flurry of new development. Rather than haul building materials for the fog signal from the sand point, the Lighthouse Board constructed a wooden tramway and hoist extending from the dock below the light station to the top of the bluff. These improvements greatly simplified the movement of

---

<sup>3</sup> F. Ross Holland, Jr., *Great American Lighthouses* (New York: John Wiley & Sons, 1994), 256.

<sup>4</sup> Nancy Farm Männikkö and Robert W. Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," n.d. (Draft), 21.

<sup>5</sup> Quinn Evans Architects, *Historic Structures Report: Raspberry Island Lighthouse*, 49.

construction materials and equipment for the fog signal to the top of the bluff. In addition to the building that housed the signal equipment, the fog signal required a cistern and pump. The fog signal was completed and placed in operation in 1903. The addition of the fog signal increased the operation and maintenance chores for the keeper and his assistant to such an extent that a third keeper was approved for Raspberry Island. To accommodate this third employee, in 1906, the lighthouse itself was completely rebuilt, resulting in the current building configuration. Within the next few years new domestic infrastructure was added to the site, including a barn, a second privy, a new woodshed, and a "shack" or shed. By 1915 the site included all the currently extant historic buildings.

Raspberry Island experienced another period of relatively little physical change from 1915 to 1939. Employees kept the station clearing free of high brush and trees and maintained the trail to the sand point, which continued to serve as a landing site when conditions precluded landing at the main dock. The dock and boathouse at the sand point gradually deteriorated and were not replaced, as the dock at the station was favored due to its convenience. Keepers and their wives continued to fill their off-duty hours with gardening – both vegetable and flower beds flourished according to the individual tastes of the site's residents. The ornamental flowerbeds achieved their most elaborate expression during the tenure of Keeper Lee Benton and his wife Anna, from 1914 to 1924. The Bentons constructed a variety of circular and rectangular beds in proximity to the lighthouse, filled them with hardy perennials and annuals, and bordered the beds with white-painted cobbles. The reconstructed flowerbeds currently extant at Raspberry Island are loosely based upon the Bentons' flower gardens.

In 1939, Congress moved the authority for operation of the nation's light stations to the United States Coast Guard. Although the Coast Guard continued to man Raspberry Island until 1947, it instituted personnel changes that affected the character of the station. Most importantly, the Coast Guard discouraged families from living at the site during the navigation season. In 1947, the Raspberry Island light and fog signal were fully automated, eliminating the need for keepers. For the first time in eighty years, the Raspberry Island Light Station lay vacant, except for periodic patrols by Coast Guard personnel. Abandonment resulted in cessation of maintenance within the station clearing.

In 1957, the Coast Guard removed the light from the lighthouse tower and replaced it with a freestanding beacon at the edge of the bluff in front of the fog signal building. The Coast Guard leased the vacant station buildings to Ellerbee Architects, a Minneapolis-based architectural firm, for use as a corporate retreat. Over the next seventeen years, company employees and clients vacationed at the site. Local caretakers, employed by the firm, maintained the buildings. During this period, modifications were made to some interior finishes in the lighthouse, and the interior of the barn was rehabilitated for use as a caretaker's apartment.

Although Apostle Islands National Lakeshore was established in 1970, Raspberry Island did not come under direct National Park Service control until 1975. By the time the Lakeshore was established, Raspberry Island had been transferred from the Coast Guard to the Bureau of Land Management (BLM), with the agreement that the Coast Guard could continue to maintain a navigation light on the island. The BLM continued the lease agreement with Ellerbee Architects, and the Lakeshore managers grew concerned that a private entity was altering the appearance of the historic light station. National Park Service regional office and the Lakeshore personnel

negotiated with the BLM for transfer of the property to the National Park Service, which was achieved in 1975.

Since 1975 the Lakeshore has managed Raspberry Island Light Station as an interpretive site. In 1977 the property was listed in the National Register of Historic Places as part of a thematic listing that included five of the Apostle Island Light Stations [NR No. 77000145]. Historic American Buildings Survey (HABS) documentation of the lighthouse and fog signal building was completed in 1989, and the lighthouse itself has been the subject of several stabilization projects.

The Historic Structure Report (HSR) for the lighthouse identified rehabilitation as the preferred treatment for the building. Plans call for rehabilitation of the keeper's quarters in the south half of the building as interpretive space and the assistant keepers' quarters in the north half of the building as quarters for seasonal employees.<sup>6</sup> Proposed upgrades to site utilities planned to support the rehabilitation of the lighthouse have the potential to affect elements of the cultural landscape (Figure 2). These upgrades include introduction of toilet facilities in the north half of the lighthouse (with associated septic tank, pump tank, and leach field); excavation of a well east of the barn to provide potable water to the lighthouse; and construction of a photovoltaic array (with associated equipment) to provide electricity.

## Scope of Work and Methodology

The purpose of this project is to complete a CLR for the Raspberry Island Light Station at Apostle Islands National Lakeshore. The CLR will serve as the primary document used by the National Park Service (NPS) to guide the treatment and use of the cultural landscape.

The CLR is divided into two parts. Part 1 includes the Site History, Existing Conditions, and Analysis and Evaluation of cultural landscape characteristics. The Site History provides a historical description of the landscape and all significant characteristics and features based upon research and historical documentation. The Existing Conditions describes the landscape, as it currently exists, including such landscape characteristics as land use, vegetation, circulation, and structures. It is based upon both site research and field surveys. The Analysis and Evaluation compares findings from the site history and existing conditions to identify the significance of landscape characteristics and features within the context of the landscape as a whole. Historic integrity is evaluated to determine if the characteristics and features that defined the landscape during the historic period remain extant.

Specific issues to be addressed in Part 1, as outlined in the project's scope of work, include:

- documentation of how the landscape has changed over time (including impacts of vegetation on historic views);
- determination of whether additional research is required for restoration and maintenance of the light station gardens, and how thoroughly prior research has been interpreted; and

---

<sup>6</sup> Ibid., 94-107.

- evaluation of the manner in which landscape treatment may complement rehabilitation of the lighthouse building while accommodating necessary improvements.

Part 2 of the CLR discusses appropriate landscape treatment. It describes strategies for long-term management of the cultural landscape based upon its significance, existing condition, and use. It includes a discussion of general management objectives for the property, as documented in planning studies and other management documents. It offers a range of schematic alternatives, with a preferred treatment alternative.

Due to the large amount of general contextual and site-specific material previously compiled for Raspberry Island, the current project did not entail additional historical research. The park's cultural resource personnel, past and present, have assembled a significant collection of primary documents, including transcribed Keepers' logs from 1872 through 1939, available in electronic format. Articles from local newspapers and historical photographs are also available from the Lakeshore cultural resource files, and the Lakeshore library contains previous planning documents. The National Park Service, Technical Information Center, in Denver provided copies of historical maps, resource studies, and contemporary site plans. These resources, as well as a variety of contracted and NPS-generated reports were used to prepare the site history and the accompanying historic period base maps.

The Keepers' log transcripts constitute the single most important source of information regarding the past appearance of Raspberry Island's cultural landscape. However, they do not present a continuous and consistent record of activities at the light station. The first surviving log entry is dated 25 July 1872, nearly ten years after the Raspberry Island light was placed in service. As a result of this lapse, the documentary record for the first decade of operations at the light station is exceedingly scant. After 1872 the level of detail contained within the logs varies considerably from keeper to keeper. For example, between 1880 and 1886 Keeper Seth Snow's daily notations record little except the temperature and weather conditions. When landscape elements are referenced in the logs these references are often cryptic, providing tantalizing evidence that a landscape feature or activity existed or had occurred, but offering little evidence as to the precise location of the feature or activity, or whether the reference represents the first occurrence or merely the first written mention. Historic photographs provide a vital source for interpreting the log entries, but often are themselves inconclusive. In short, while the documentary source material held by the Lakeshore probably constitutes all the readily available material on the Raspberry Island Light Station, it does not permit development of a precisely detailed and perfectly accurate chronology of landscape developments and activities at the light station.

The light station buildings are generally oriented with their primary facades facing southwest, towards the mainland. However, the Keepers' logs and other official records consistently refer to the buildings as facing west. This convention has been adopted for this CLR.

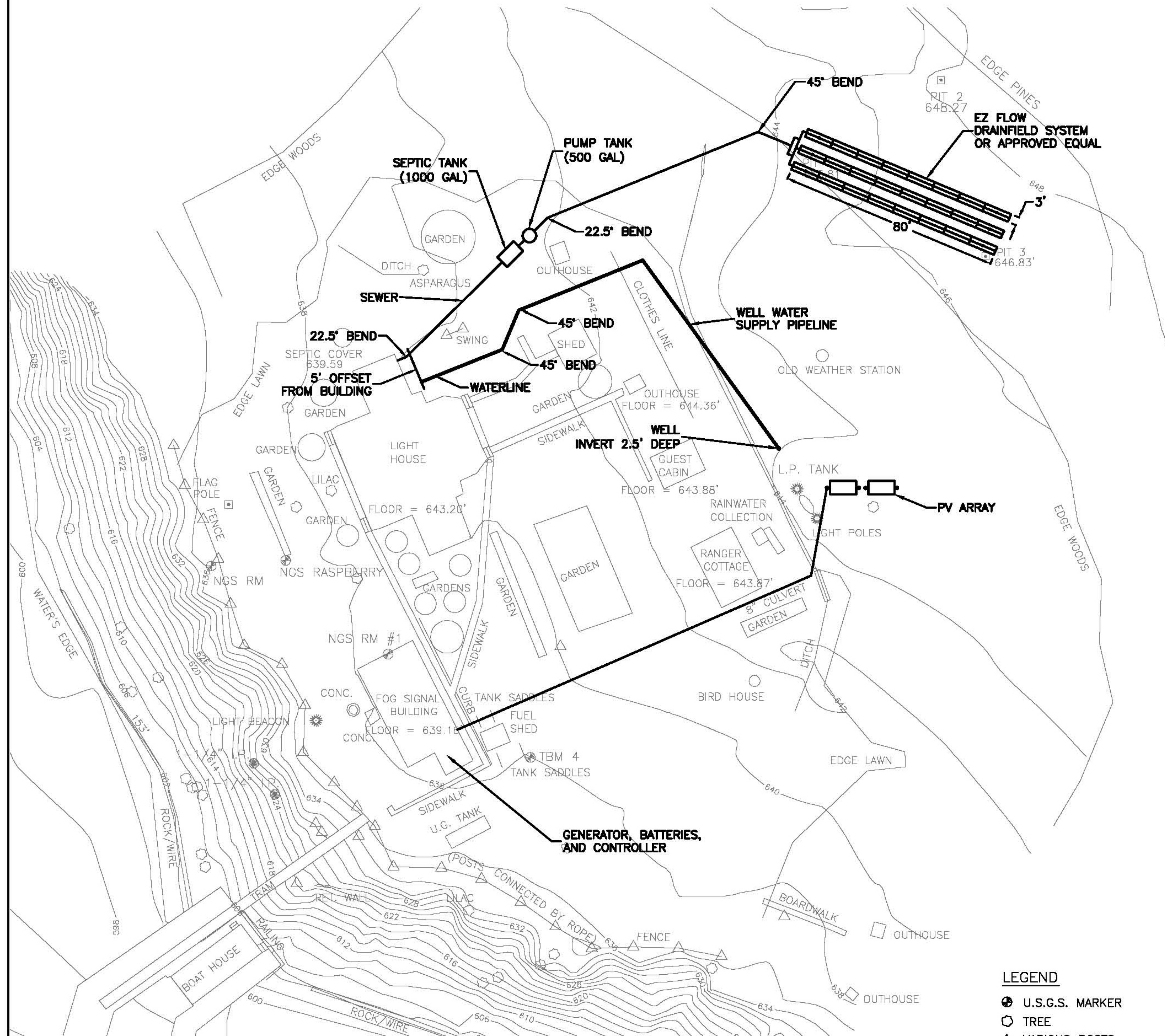
To document existing conditions at Raspberry Island, HRA Gray & Pape personnel conducted three visits to the site, one in December of 2002, one in May of 2003, and one in September 2003. Work conducted during these visits included examination and photographic documentation of extant landscape features to permit comparison of their current appearance and condition with their appearance during the historical period. HRA personnel mapped and photographed one archaeological feature, which had been identified by the Lakeshore personnel during the December 2002 field trip.



INSERT 11x17 MAP

Figure 2. Utilities site plan (provided by ARCADIS).





# SURVEY NOTES

ALL SURVEY INFORMATION  
PROVIDED BY:

NELSON SURVEYING INC.,  
ASHLAND, WI  
10/99  
REV. 10/03

## MONUMENTS

NAME: NGS RASPBERRY  
DESCRIPTION: NGS CONTROL POINT  
N. 658803.8843  
E. 1767495.3280  
ELEV. 637.64

NAD 83(1991)  
N. 46°58'13.62068" (LATITUDE)  
W. 090°48'18.32985" (LONGITUDE)

NAME: NGS RM  
DESCRIPTION: NGS CONTROL POINT  
N. 658801.8005  
E. 1767468.2391  
ELEV. 637.01

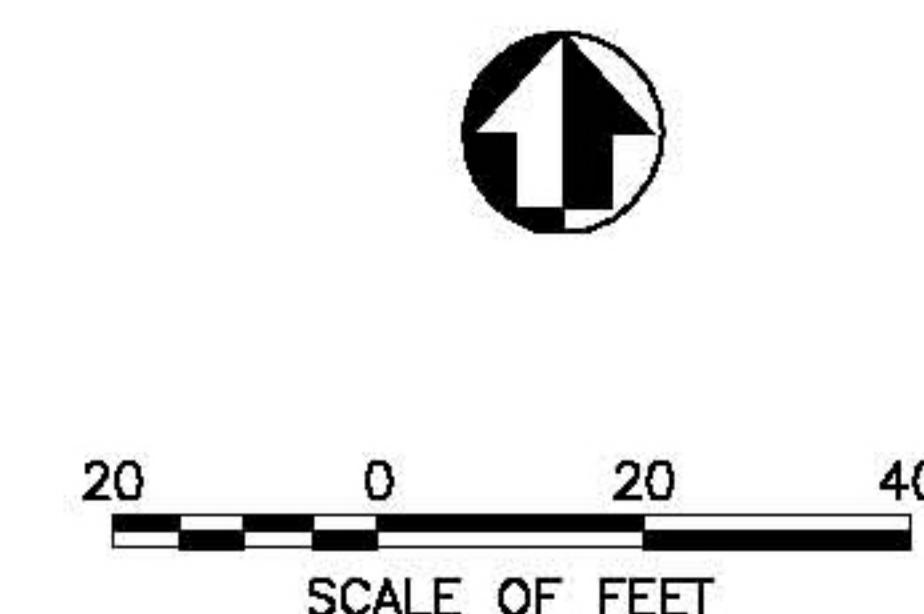
NAME: NGS RM #1  
DESCRIPTION: NGS CONTROL POINT  
N. 658769.7342  
E. 1767532.5528  
ELEV. 639.11

NAME: TBM 4  
DESCRIPTION: TOP OF S.E. TANK  
SADDLE (SOUTH EDGE)  
N. 658732.2130  
E. 1767582.6448  
ELEV. 639.94

HORIZONTAL DATUM: BASED ON NGS RASPBERRY  
VERTICAL DATUM: ELEVATIONS ARE INTERNATIONAL GREAT  
LAKES DATUM (I.G.L.D.).

## LEGEND

- U.S.G.S. MARKER
- TREE
- VARIOUS POSTS



DESIGNED: GADD ST	SUB SHEET NO.	TITLE OF SHEET <b>UTILITIES SITE PLAN</b>	DRAWING NO. <b>633</b> <b>41017A</b>
TECH. REVIEW: RLC		RASPBERRY ISLAND APOSTLE ISLANDS NATIONAL LAKESHORE	PMIS/PKG NO.
DATE: 1/15/04			SHEET OF



Treatment recommendations contained within Part 2 are based upon the results of the analysis and evaluation in Part 1, and address the cultural landscape features that contribute to the significance of the site. In addition, recommendations in the CLR support the recommendations included in earlier planning documents, such as the Raspberry Island Historic Structure Report completed in 2000.

## Study Boundaries

Previous documentation of the Raspberry Island Light Station has focused on the lighthouse building cluster – principally upon the lighthouse itself. For example, the National Register boundary for the property incorporates only the two acres containing the lighthouse and associated buildings – the area described in the following chapters as the lighthouse yard.

During initial review of the station history, it became clear that the landscape boundary should include the entire island. Unlike other Apostle Island light stations, the Lighthouse Board reserved the whole of Raspberry Island. Consequently, land use on the island during the historical period was legally restricted to activities associated with the mission of the Lighthouse Board and the domestic needs of the station keepers and their families.

Although the CLR establishes the island as the cultural landscape, the focus of analysis for this CLR is the area within the historic light station clearing – a roughly six-acre space that includes both the two-acre lighthouse yard, with its associated buildings (Figure 3), and four acres surrounding the yard. This area was cleared historically to permit the unobstructed sweep of the light, and is presently in the process of being reclaimed by the surrounding forest. During much of the historic period, a fence separated the lighthouse yard from the remainder of the clearing.<sup>7</sup> The lighthouse yard contained buildings, structures, and formal and informal landscaping elements used on a daily basis by the keepers and their families. The remainder of the clearing, beyond the fence, was primarily intended to provide a clear arc for the light. A variety of uses that did not interfere with this primary goal occurred within the clearing, including hay fields. Information regarding the use of the remainder of the island beyond the clearing is included, since land use in these areas is important to understanding the functioning of the station as a whole. Treatment alternatives discussed in Part 2 address the entire six-acre station clearing, including the two-acre lighthouse yard.

Raspberry Island Light Station was listed in the National Register of Historic Places in 1977. Both the Apostle Islands Lighthouses National Register nomination and a draft Apostle Islands Light Stations National Historic Landmark (NHL) nomination establish that eight buildings and seven structures retain integrity and contribute to the significance of the Raspberry Island Light Station (Table 1). The station's period of significance is defined as 1862 to 1947, with 1862-1901 and 1902-1947 detailed as distinct development eras.

Several of the resources identified in the draft NHL nomination as structures are discussed in this CLR as "small scale features." These resources are small in scale and simply constructed, and

---

<sup>7</sup> For the purpose of clarity the area west of (inside) the fence will be identified throughout this report as the lighthouse yard, while the area east of (outside) the fence will be identified as the station clearing.

appear to best conform to the National Register definition of "object." They are readily distinguished from the larger and more complex buildings and structures on site. During development of this CLR additional resources, both contributing and non-contributing, were identified. All these resources are described in Chapter 3. Their historic integrity and status as contributing or non-contributing resources is evaluated in Chapter 4. The developmental periods identified in this CLR are slightly different than those in the draft NHL nomination, but generally reflect the major periods of development and change at the site. These development periods are adequate to address the extant cultural landscape.

Table 1. Contributing Resources Identified in National Historic Landmark Nomination<sup>8</sup>

Resource Name	Structure Number	LCS ID	Status (Building or Structure)	NR Status (Contributing/Non Contributing)
Light Station and Keeper's Quarters	08103A	006390	Building	Contributing
Keeper's Privy	08102E	006395	Building	Contributing
Assistant Keepers' Privy	08102D	006394	Building	Contributing
Shed #1	08102G	006374	Building	Contributing
Shed #2	08102F	006396	Building	Contributing
Barn	08102C	006393	Building	Contributing
Oil Building	08102G	006374	Building	Contributing
Fog Signal Building	08102B	006392	Building	Contributing
Range Marker			Structure	Contributing
Flagstaff			Structure	Contributing
Swing			Structure	Contributing
Navigational Beacon			Structure	Contributing
Steps and Tramway	08104B	101624	Structure	Contributing
Sidewalks	08104A	101630	Structure	Contributing
Boathouse	08102K	101623	Structure	Contributing
Dock	08102A	006391	Structure	Contributing

<sup>8</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 8.

INSERT 11x17 MAP

Figure 3. Site map.



-Figure Created in AutoCAD 2000 for HRA/Gray & Pope Project 02-32012 - Draft of 5-13-2004



## Summary of Findings

The boundary of the Raspberry Island Light Station cultural landscape should encompass the entirety of Raspberry Island. Land use across the 296-acre island varied in intensity and development resulting in a differential distribution of cultural resources. The period of significance extends from construction of the first lighthouse to the end of U.S. Coast Guard management and operation (1862-1947).

The majority of permanent improvements, those critical to the associative and interpretive value of the site, are clustered within a two-acre space at the southwest end of the island. These improvements largely date from the second period of development at the station. This period, which began with construction of the fog signal building in 1902 and extended through the cessation of Coast Guard management in 1947, constitutes the primary period of interpretation for the station. Extant historical buildings possess good integrity, but are generally in only fair condition, with some in need of immediate stabilization efforts. As during the period of significance, this area contains the island's only formal landscaping, reconstructed and maintained to roughly approximate the light station's ca. 1920 appearance.

Other than the primary building cluster, the components of the cultural landscape lack integrity. The small cluster of historical buildings and structures formerly located at the sand point are no longer extant. The sand spit continues to function as an alternate boat landing when conditions prevent use of the primary dock. As a consequence, the historic trail between the sand spit and light station is maintained to current pedestrian trail standards. The NPS reconstructed the trail to the Sand Island overlook that existed during the historic period.

Apostle Islands National Lakeshore has selected Raspberry Island Light Station as the principal site from which to interpret the historically important theme of shipping in the Great Lakes region. Of the six light stations located within the boundaries of the Lakeshore, Raspberry Island is the most easily accessible, and the National Park Service plans to enhance visitor experience through a combination of site restoration and interpretive programs staffed with on-island seasonal employees. Interpretive efforts will focus on the work and domestic lives of the light keepers and their families, as well as the relationship of one lighthouse to another in guiding vessels through the shipping lanes of the Apostle Islands Archipelago.

## Treatment Alternatives

The primary recommended treatment for the Raspberry Island Light Station landscape is rehabilitation. Three treatment alternatives are presented. Alternative I emphasizes preservation of existing forms, materials, and integrity through stabilization, preservation maintenance, and repair of historic materials and features. This alternative seeks to maintain the existing program of preservation and maintenance, while implementing the planned rehabilitation of the lighthouse, as detailed in the Historic Structure Report for the property. A defensible fire perimeter will be established in the clearing by removal of brush and trees within one hundred feet of the building cluster (as defined by the historic location of the lighthouse yard fence).

Alternative II incorporates the preservation, maintenance, and rehabilitation of historic buildings and structures within the lighthouse yard as detailed in the HSR and Alternative I. Additionally,



landscape elements within the yard will be rehabilitated to reflect the period from 1902-1947, including provisions for reconstruction of several historically significant, non-extant features within the lighthouse yard and station clearing. Under Alternative II additional brush and trees will be removed from portions of the clearing so as to reestablish the view from the lighthouse tower to the west edge of the island. The remainder of the clearing, outside the fire perimeter described for Alternative I, will be maintained as at present.

Alternative III differs from Alternative II only in its treatment of the clearing. All actions proposed within the lighthouse yard under Alternative II are included in this alternative. Alternative III proposes to rehabilitate the physical extent and visual character of the historic clearing by removal of trees and brush and reintroduction of a prescribed fire regime.



## Chapter 2: Site History

### Regional Economic Development and the Growth of Lake Superior Shipping

The western end of Lake Superior was one of the last areas east of the Mississippi River settled by Euroamericans. The fur trade brought Euroamericans into the region in the seventeenth century, but the decline of that trade in the 1830s and 1840s stifled development and population growth, and it was not until the 1850s that mining, fishing, and lumbering sparked sizeable permanent settlement in the region.<sup>1</sup>

As settlers pushed into the Lake Superior region in search of timber and minerals, the United States government bought land from the resident Ojibweg through cessation treaties.<sup>2</sup> These included the Treaty of 1836, ceding land in Michigan's Upper and Lower Peninsulas and parts of the Great Lakes; the Treaty of 1837, ceding land in north central Wisconsin and east central Minnesota; the Treaty of 1842, ceding land in northern Michigan and Wisconsin, and the western part of Lake Superior; and the Treaty of 1854, ceding lands in northeastern Minnesota and creating reservations for many Ojibwe bands.<sup>3</sup> These treaties effectively opened the region to permanent settlement by Americans.

The region's fishing industry emerged from ashes of the fur trade. In 1835 the American Fur Company began commercial fishing operations out of its former fur trading headquarters at La Pointe, employing former company boatmen. Salted fish from Lake Superior were shipped to company warehouses in Detroit for distribution to eastern and southern markets. This market failed during the Panic of 1837 and the company ceased its fishing operations in 1841. Nevertheless, commercial fishing continued to be conducted in the region.<sup>4</sup>

Until the 1850s the Great Lakes region had little influence upon the industrial economy of the United States. The region's later role, as a major supplier of industrial raw materials, was only faintly suggested prior to the Civil War. Not until the federal government completed the Sault Ste. Marie locks and canal in 1855 was Lake Superior connected by a direct water route to the east. That year 1445 tons of iron ore passed through the locks. By 1860 that amount had reached 117,000 tons, as the Marquette, Menominee, Gogebic, Vermillion, and Mesabi "ranges" were developed. Copper had been mined in the Upper Peninsula of Michigan for a decade prior to the

---

<sup>1</sup> David J. Cooper, Megan A. Partlow, Bradley A. Rodgers, Gregory T. Smith, and Gordon P. Watts, Jr., *By Fire, Storm, and Ice: Underwater Archeological Investigations in the Apostle Islands*, 2nd ed. rev. (Madison: State Historical Society of Wisconsin, 1996), 1.

<sup>2</sup> There are several terms used in reference to the Ojibwe people. Ojibweg is the plural form. A commonly used anglicized term for Ojibweg is Chippewa.

<sup>3</sup> Edmund Jefferson Danziger, Jr., *The Chippewas of Lake Superior* (Norman: University of Oklahoma Press, 1979), 79-81, 89-89; Great Lakes Indian Fish and Wildlife Commission, *A Guide to Understanding Ojibwe Treaty Rights* (Odanah, WI: Great Lakes Indian Fish & Wildlife Commission, 2002), 3.

<sup>4</sup> Cooper, Partlow et al., *By Fire, Storm, and Ice*, 1.

opening of the locks, with production totaling approximately 3100 tons in 1855. By 1860 production had risen to approximately 8000 tons.<sup>5</sup>

It took years of experimentation with these ores, and enormous investments in shipping facilities, as well as successive enlargements of the Sault Sainte Marie Canal ( "Soo") in 1876 and 1896, before these resources could be put to maximum use. Annual shipments of iron ore did not reach one million tons until 1872, but with a surge of investment in the 1880s, by 1900 Great Lake ores represented 75 percent of the nation's total iron ore production. The production of copper ore reached 20,000 tons per year in 1874. These mines were immensely profitable, producing copper for less than ten cents a pound and selling it for approximately twice that amount.<sup>6</sup>

Following the initial discoveries of iron ore, and the platting of the area for non-Indian settlement by the General Land Office, new settlers moved into the region. In 1854 Asaph Whittlesey established the town of Whittlesey, later the city of Ashland, near the head of Chequamegon Bay, a large, sheltered body of water on the south shore of Lake Superior, sheltered from the lake's frequent storms by the Apostle Islands Archipelago. That same year W.W. Corcoran and others organized the town of Superior, selling over 2000 lots between 1854 and 1857. Bayfield was platted in 1856, and in 1857, despite the onset of a nationwide financial panic, Duluth was platted and incorporated.<sup>7</sup>

Surveyors with the General Land Office mapped the Apostle Islands between 1850 and 1857. They found significant non-Indian settlement only on Madeline Island where the French had established a mission in La Pointe, and where "clearings, pastures, farms, dwellings, and churches" extended along the western shore. More isolated island outposts were limited to Benjamin Armstrong's house and clearing on the southern tip of Oak Island, William Wilson's house and clearing on Hermit Island, and an American Fur Company fish house on Stockton Island.<sup>8</sup>

Prior to the completion of the "Soo" Canal at Sault Ste. Marie in 1855, cargo shipped up or down Lake Superior had to be laboriously transported around the rapids of the St. Mary's River. Completion of the canal transformed Lake Superior into a water highway allowing continuous waterborne transport from Duluth to Lake Ontario, and on to the Atlantic via the St. Lawrence or Erie Canals. As economic activity increased at the head of Lake Superior so did the volume of maritime traffic passing through or north of the Apostles.<sup>9</sup>

---

<sup>5</sup> Victor S. Clark, *History of Manufactures in the United States*, 3 vols. (New York: Peter Smith, 1949), 1:348-349.

<sup>6</sup> Cooper et al., *By Fire, Storm, and Ice*, 2-3; D.W. Meinig, *The Shaping of America: A Geographical Perspective on 500 Years of History, Volume 3: Transcontinental America, 1850-1915* (New Haven, CT: Yale University Press, 1998), 233-234; Clark, *History of Manufactures*, 2:368-369.

<sup>7</sup> Cooper et al., *By Fire, Storm, and Ice*, 2.

<sup>8</sup> Lawrence Rakestraw, D. J. Frederick, C. R. Eder, R. A. Van Dyke, and B. J. Griewe, "Original Forest Vegetation and Land Use History of the Apostle Islands National Lakeshore," *Proceedings of the First Conference for Scientific Research in the National Parks*, 1976, 2-3. Manuscript on file at the NPS Denver Service Center Technical Information Center, Denver, Colorado (hereafter DSC TIC).

<sup>9</sup> Cooper et al., *By Fire, Storm, and Ice*, 3; Peter Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," February 1988, 48. Report prepared for the National Park Service, Midwest Regional Office and on file at the Lakeshore Library.

Maritime traffic on Lake Superior increased further with the rapid expansion of the region's agricultural, logging, mining, and fishing industries in the 1870s. Duluth and Superior became important transfer points for shipment of grain headed east. In 1885 Duluth boasted eleven grain elevators, while Superior was building its first. By 1891 Duluth had thirteen elevators and Superior ten. Lake vessel capacities increased significantly during this period, from 80,000 bushels in 1880 to 120,000 bushels by 1890, and 400,000 bushels by 1900.<sup>10</sup>

The lumber industry in the west end of Lake Superior contributed in a substantial way to the regional economy beginning in the 1870s. Logging on a significant commercial scale in the region began in the 1850s, with the construction of sawmills in Bayfield, Ashfield, and La Pointe. The growth of Great Lakes port cities after the Civil War, and particularly the reconstruction of Chicago following the fire of 1871, produced a significant demand for lumber. The completion of the Wisconsin Central Railway between Milwaukee and Ashland in 1877 spurred the growth of the industry, which continued to play a major role in the regional economy into the 1920s.<sup>11</sup>

The completion of the Wisconsin Central Railway also facilitated exploitation of the enormous copper and iron ore reserves along Lake Superior's shores and on Michigan's Keweenaw Peninsula. Also developed during this period were the lake's brown sandstone ("brownstone") quarries, which supplied the Midwest's construction industry, and a burgeoning fishing industry. Commercial fishing prospered in the west end of Lake Superior from the mid-1880s. The industry peaked in 1915 and entered its final decline in the 1920s and 1930s.<sup>12</sup>

By the 1890s, 80 percent of all maritime freight tonnage moved in the United States passed through the "Soo" Canal.<sup>13</sup> Much of this traffic also passed by the Apostle Islands, either bound for Bayfield, Ashland, and the other small cities sheltered in the lee of the archipelago, or skirting north of the islands enroute to and from Duluth and Superior.

The islands served as a source of raw materials for the south-lake communities.<sup>14</sup> By the 1870s, Oak, Manitou, Stockton, Sand, Rocky, and Otter Islands all had fishnet settings near their shores, and the local press described the Apostle Islands' fishing industry as a significant contributor to the local economy.<sup>15</sup> Stone quarries operated roughly between 1865 and 1900, first on Basswood Island where, in 1870, Strong, French, & Co. of Milwaukee were "working forty men and ...

---

<sup>10</sup> Cooper et al., *By Fire, Storm, and Ice*, 3; William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W.W. Norton & Co., 1991), 376-377.

<sup>11</sup> Cooper et al., *By Fire, Storm, and Ice*, 4-5.

<sup>12</sup> Ibid., 3-4; William Cronon, "An Eclectic Chronology of Apostles Islands Lighthouse History," no date, File: Cultural Resources - Plans, Apostle Islands National Lakeshore Library, Bayfield, Wisconsin (hereafter cited as Lakeshore Library). By 1902, Ashland, Wisconsin, was also the eastern terminus of the Northern Pacific Railroad, the northern terminus of the Chicago & North-Western, Wisconsin Central, and Minneapolis, St. Paul & Ashland railroads, and was also connected to the Chicago, St. Paul, Minneapolis & Omaha. The Duluth, South Shore & Atlantic Railroad passed just south of Ashland.

<sup>13</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," Draft n.d., 21.

<sup>14</sup> Rakestraw et al., "Original Forest Vegetation and Land Use History of the Apostle Islands National Lakeshore," 1.

<sup>15</sup> *The Bayfield Press*, Vol. 1, No. 35, Saturday, June 10, 1871, 1.

getting out large quantities of probably the finest building material in the West," and, later, on Hermit and Stockton Islands.<sup>16</sup> Beginning in the 1870s and continuing through the 1910s, Oak, Stockton, Michigan, Outer, Sand, and Basswood Islands (and possibly others) all sustained substantial logging operations, supplying local mills with valuable white pine and oak, and also providing fuel for steamships and hemlock bark for the tanning industry. Logs were harvested during the winter and floated (softwood) or barged (hardwood) to mainland mills after ice break-up in the spring.<sup>17</sup> Island ships also carried passengers, both settlers and, by the 1880s, vacationers traveling on Apostle Island excursions arranged by the railroads and inter-lake boat lines.<sup>18</sup>

The local press carefully reported the shipping news – the ships and their cargo testifying to the region's glowing economic prospects: "Capt. Pike is shipping considerable stone from his quarry to Ashland"; "Holston & Boutin's camp at Sand Island is rushing in the logs at a lively rate"; "Henry Murphy, of La Pointe, has bought the scow *Emma Maria* . . . and will sail her in the lumber, wood, and tanbark trade between Bayfield, Ashland and the Apostle Islands and Duluth"; "The *Belle Stevens* and *Emma Maria* loaded with hemlock bark out at Bass Island on Monday"; "the neat little tug *J. C. Keyes* . . . will undoubtedly be extensively patronized both by people having business at Ashland and the pleasure seekers who yearly congregate at Bayfield."<sup>19</sup> The owners and captains of these vessels demanded navigational aids to assure safe passage through the islands where "reefs, submerged rock pinnacles and tortuous channels were a navigator's nightmare."<sup>20</sup> Built both in response to mariners' demands and also as a means of enticing additional trade, the Apostle light stations were closely associated with the region's industrial and economic development.<sup>21</sup>

The Apostle Island light stations were part of a long maritime tradition. On August 7, 1789, Congress transferred the jurisdiction and administration of lighthouses built and maintained by the former colonial governments to the Department of the Treasury under the auspices of the newly created United States Lighthouse Service. By 1852, when Congress created the

---

<sup>16</sup> Anonymous, "The Brownstone Quarries of the Apostle Islands," *The Bayfield Press*, Vol. 1, No. 1, Thursday, Oct. 13, 1870, p. 1, File: Cultural Resources – Plans, Lakeshore Library.

<sup>17</sup> *The Bayfield County Press*, Vol. 11, No. 24, Saturday, April 4, 1885, 8.

<sup>18</sup> Rakestraw et al., "Original Forest Vegetation and Land Use History of the Apostle Islands National Lakeshore," 5-7. In 1883, for example, *The Bayfield Press* reported that "the influx of summer visitors to the Apostle Islands promises to be unusually large this summer" (Vol. 9, No. 25, Saturday, April 14, 1883, 1). In addition to out-of-area tourists, island vacationers also included local residents: In June 1882, for example, *The Bayfield Press*, urged its readers to "get up an excursion and picnic on some of the Islands for the Fourth, if we can't do anything else" (Vol. 8, No. 34, Saturday, June 17, 1882, 4).

<sup>19</sup> *The Bayfield Press*, Vol. 10, No. 15, Saturday, Feb. 2, 1884, 1; *The Bayfield County Press*, Vol. 11, No. 24, Saturday, April 4, 1885, 1; *The Bayfield Press*, Vol. 8, No. 27, Saturday, April 29, 1882, 1; *The Bayfield Press*, Vol. 9, No. 25, Saturday, April 14, 1883, 1; *The Bayfield Press*, Vol. 7, No. 40, Saturday, July 23, 1881, 3.

<sup>20</sup> Cooper et al, *By Fire, Storm, and Ice*, " 4-5; Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 25; Hamilton Nelson Ross, *La Pointe. Village Outpost on Madeline Island* (Madison: State Historical Society of Wisconsin, 2000), 74.

<sup>21</sup> Herschel L. D. Parnes, "Apostle Islands Lighthouses National Register Nomination," 1977, Section 8, 1. On file at the Lakeshore Library, and the Wisconsin State Historic Preservation Office, Madison, Wisconsin.

Lighthouse Board to alleviate corruption and maximize efficiency within the Lighthouse Service, the number of light stations in the United States had grown from nine to over 400.<sup>22</sup>

Headed by scientist Joseph Henry and including representatives from the Navy and the Army Corps of Engineers, the Lighthouse Board established twelve Lighthouse Service Districts, with District 11, headquartered in Detroit, administering Lake Superior stations. A lighthouse inspector, most-often a naval officer, headed each district and was responsible for administration, personnel, and station inspection. The inspector was assisted by the district engineer – always an officer with the Army Corps of Engineers – who was responsible for station design, construction, and repair. Lighthouse Service District work crews built the lighthouses.<sup>23</sup>

In 1852, Congress authorized construction of eleven light stations on the upper Great Lakes. Completed in the mid-1850s, these lights functioned principally as navigational aids for vessels bound to and from Chequamegon Bay and La Pointe, on Madeline Island, via the North and South Channels. These lights provided little assistance to the ever-increasing volume of shipping moving through the islands' West Channel to the new ports of Bayfield and Ashland (Figure 4). In response, Congress appropriated funds for construction of the Raspberry Island light station in 1859.<sup>24</sup> Completed in 1862, difficulties in obtaining a lens prevented the station from entering service until the following summer.

By the late 1860s, shipping patterns had again shifted, with larger vessels passing north of (or "outside") the Apostles. To meet the demands of these new shipping patterns a second ring of lighthouses was developed on the outer edges of the archipelago. The Outer Island station was first lit in 1874, followed in 1881 by the Sand Island station and in 1891 by the Devil's Island station, the last built in the archipelago.<sup>25</sup>

The development at the Apostle Island light stations was defined by two themes: 1) the development and evolution of resources directly associated with light stations' use as navigational aids, a history strongly affected by the economic conditions that influenced shipping patterns and by the technological changes that influenced lighthouse working systems (foghorns; lights) and 2) the development and evolution of domestic resources associated with the shelter, sustenance, and recreation of the personnel charged with station operation and maintenance. These domestic resources included dwellings, privies, water supply, storage facilities, circulation systems, and areas of concentrated land use, such as hay fields, garden plots, and wood lots. These themes are closely interconnected, and "typical" station infrastructure therefore follows a predictable pattern founded on the station functions and the number of people employed in its operation. At Raspberry Island the fog signal most clearly demonstrates this interconnection, its

---

<sup>22</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 20; Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, December 2000, 7. Report prepared for the National Park Service and on file at Apostle Islands National Lakeshore Headquarters, Bayfield, Wisconsin.

<sup>23</sup> Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," 6-9. Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 7.

<sup>24</sup> *Annual Report of the Lighthouse Board*, 1859 (no entry number). Electronic abstract file transcribed by Terry Pepper, 2001, and provided to HRA by the National Park Service, Apostle Island National Lakeshore.

<sup>25</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 24-25.



Figure 4. 1856 navigation channel map.

construction in 1902-1903 resulting in numerous and substantial modifications to the station complex.

## **Initial Construction and Operation of the Raspberry Island Light Station: 1859 to 1901**

In March 1859, President James Buchanan reserved 296-acre Raspberry Island for construction of a lighthouse. Local entrepreneurs and shipping captains agitated for immediate construction of the light. One of Bayfield's founders, former Minnesota territorial legislator Henry M. Rice, promoted the community to eastern investors by noting its deep harbor and arguing that Bayfield could become a commercial rival of Chicago's. Rice claimed that he intended to build a railroad from St. Paul to Bayfield. In July 1859, Rice wrote Secretary of the Treasury Howell Cobb informing him of the importance of establishing a lighthouse on Raspberry Island.<sup>26</sup> For Rice and other local boosters, construction of the Raspberry Island Lighthouse was less a response to existing traffic than an investment in the hope of attracting future traffic to their businesses. For others, the need for the station was more immediate. On July 21, 1859, J. D. Bright, aboard the steamer *North Star*, endorsed a lighthouse on Raspberry Island. To Secretary Cobb he wrote:

The master of this steamer, Capt. Sweet, has just pointed out to me Raspberry Island ... for which there was an appropriation last Congress to build a "lighthouse." He has explained to me the difficulty and peril of navigating this part of the lake in the night time, without some guide at the point named. He has satisfied me that there is an urgent public necessity for this improvement and the effect of this letter is to ask you to order Capt. Smith (who I believe has charge of this branch of the public service) to commence this work with as little delay as possible. Your attention to this matter will confer benefit on a large number of people.<sup>27</sup>

In 1860, the federal government formally requested bids for the station's construction.<sup>28</sup> Four contractors bid to furnish the lumber and supplies to construct the lighthouse: R.E. Coburn, of Superior; G.H. Scote, of Detroit; Elisha Pike of La Pointe; and the firm of Dairson, Brunett and LaBonte, representing local merchants. It remains unclear which of the four won the bid. In the construction of subsequent 11th District lighthouses, however, the district commonly acquired building materials in the Detroit area and directed district-wide Lighthouse Board building crews to build the structures. Construction of the Raspberry Island station may have conformed to this general pattern.<sup>29</sup>

---

<sup>26</sup> David Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 1994, 18. Report prepared for Apostle Islands National Lakeshore, Bayfield, Wisconsin. (Omaha, Nebraska: U.S. Department of Interior, 1994.)

<sup>27</sup> Quoted in Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 21.

<sup>28</sup> Ibid; *Annual Report of the Lighthouse Board*, 1861 (no entry number).

<sup>29</sup> David Snyder reports that his research in local and National Archives records failed to reveal either the winning bidder or the name of the builder. See Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 21.

On June 10, 1862, Engineer J. D. Graham (10th and 11th Lighthouse Districts, Detroit) acknowledged the authority to construct a lighthouse on Raspberry Island for \$5,500. Construction proceeded through the summer of 1862 and the station was ready for light display by fall of that year. As a result of a series of delays and miscommunications, delivery of the lens was delayed through the last months of the 1862 navigation season and into the first months of the next. Finally, on July 1, 1863, the Lighthouse Service published a *Notice to Mariners* that the station's light would be exhibited for the first time on or about July 20, 1863.<sup>30</sup>

Initial construction at Raspberry Island included a wood-frame single-family residence/lighthouse tower erected on a high bluff at the southwest end of the island, where the light would be visible to those plying both the West Channel and the lake proper (Figure 5). The location was ideal for a lighthouse, not only because it faced the West Channel, but also because the lighthouse could be built atop a high clay bluff that rises 40 feet above the surface of the lake. Workers cleared the native timber from an area of roughly six acres. The site selected for the lighthouse lay slightly south of center within the clearing, far enough from the edge of the bluff that erosion would not endanger the building. Construction of the 37-foot tall lighthouse tower created a 77-foot-high focal plane above the lake level. The clearing defined the arc of the light – between roughly 145 and 340 degrees – towards the West Channel and northward into the lake. Topography and vegetation blocked the projection of the light to the east. Within the tower, the Lighthouse Service installed a "catadioptric lens of the fifth order, system of Fresnel" that showed a fixed white light, varied by bright flashes at intervals of 90 seconds, visible "in ordinary states of the atmosphere, from the deck of a vessel, [for] a distance of fourteen (14) nautical miles."<sup>31</sup>

The lighthouse tower occupied the center of the lighthouse building, which included a two-story residence and a one-story kitchen wing. The dwelling space was designed to house the keeper and his family and an unmarried assistant keeper.<sup>32</sup> The interior contained a central hallway and stair landing, providing access to the second floor of the residence and to the lighthouse tower/lantern room, a dining room, a parlor, an upstairs dry bath or cleaning room, and two upstairs sleeping chambers. The one-story kitchen wing, built atop a cellar, extended from the north end of the building.<sup>33</sup>

---

<sup>30</sup> Ibid., 26-28.

<sup>31</sup> Fresnel lenses, invented in 1822 by French physicist Augustine Fresnel, were organized into seven "orders," first order representing the largest light. "Notice to Mariners, No. 97," vertical file: Lighthouses, Raspberry Island, Lakeshore Library; Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 26-28. This system was modified slightly in the following seasons: in 1864, Inspector Gardner of the 11th District requested "flashing lights of glass" for the Raspberry Island station; in the spring of 1868, Captain A. L. Case, 3d District Inspector, sent instructions re a white flashing apparatus for Raspberry Island to 11th District Inspector Stevens. In 1895 the Lighthouse Board reported that by the opening of navigation the Raspberry Island light had been changed from a fixed white light varied by a white flash every 90 seconds to a fixed white light varied by a flash every minute. Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 33; *Annual Report of the Lighthouse Board*, 1895, entry 1269.

<sup>32</sup> An assistant keeper was first funded and appointed in 1868. The assistant keeper position was not funded between 1882 and 1886. Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 181.

<sup>33</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 23.





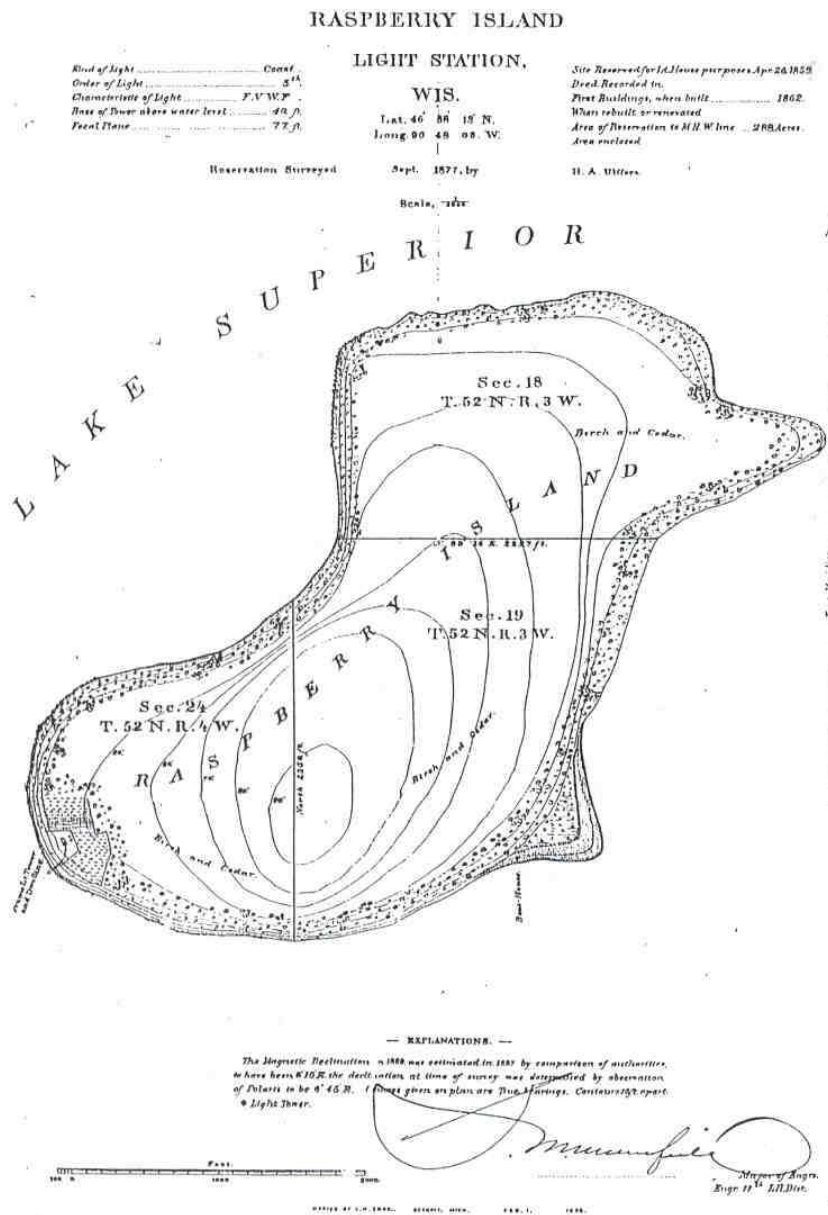
Figure 5. View to northeast of lighthouse, ca. 1890. Note board fence to right, rear. The woman appears to be standing on a plank walkway (Lakeshore archives).

Additional buildings and structures completed in association with initial site development are believed to have been limited to a privy; a wood shed; a cistern, pump, and well; and a dock and at "the sand point"<sup>34</sup> (Figure 6). Located three-quarters of a mile east of the primary building complex, the sand point was also referenced in the Keepers' logs as the east point and was defined as a "sheltered nook" and sandy beach where boats found an easy landing and where the keeper's skiff was sheltered from storms.<sup>35</sup> The materials used to build the lighthouse in 1862 were hauled from the landing at the sand point to the station clearing.

---

<sup>34</sup> The locations of the coal shed and this early barn have not been documented. The Keeper's logs also refer to the sand point as the sand spit. There does not appear to have been a proper place name for this landscape feature.

<sup>35</sup> A September 1887 storm illustrated the importance of the dock at the sand point and the severity of Lake Superior's weather. Keeper Francis Jacker, observing a gale rising in the west, tried quickly to move the station row boat from its mooring at the dock below the station to the shelter of the sand point. Blown off course, Jacker landed on uninhabited Oak Island where, with neither family nor Assistant on Raspberry Island to report his absence, and barring an act of providence, he faced starvation or death by exposure. His wife unexpectedly visited Raspberry Island three days later and, finding the light dark and the station abandoned, organized a successful rescue. Francis Jacker Diary (hereafter Jacker Diary), September 16, 1887, transcribed and available in Historical Files, Apostle Island National Lakeshore Headquarters, Bayfield, Wisconsin; Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 29.



Survey map of Raspberry Island Light Station Reservation, Wisconsin, September 1877.

Figure 6. 1877 site map. Light station clearing at southwest tip of island.

In 1867 the Lighthouse Board noted in its *Annual Report* that the station needed a boat landing and steps leading from the landing to the top of the bluff where the buildings stood. This improvement would spare the station keepers the arduous chore of hauling all goods and supplies from the sand point. Completed in 1868, the landing consisted of a cribbed dock. The stairs, however, were not completed until 1873. In 1877 the U.S. Lighthouse Engineers constructed new stairs and dock cribs at the station, and in 1878 they erected a boathouse, presumably at the sand point since a ca. 1891 photograph of the station (Figure 9) does not include a boathouse.<sup>36</sup> In any event, the station dock and boathouse were subject to serious damage almost every winter as a result of ice floes and storms, and repairs to the dock and boathouse were a priority nearly every spring, when the keeper and his assistants returned to the island. The *Annual Report of the Lighthouse Board* of 1894 notes that "The landing was extended by the addition of a crib. The boathouse was taken down and rebuilt adjoining the landing, on a foundation crib. New stairs were erected at the bank approaching the landing." The deck/crib structure was rebuilt again in 1900<sup>37</sup> (Figure 7).

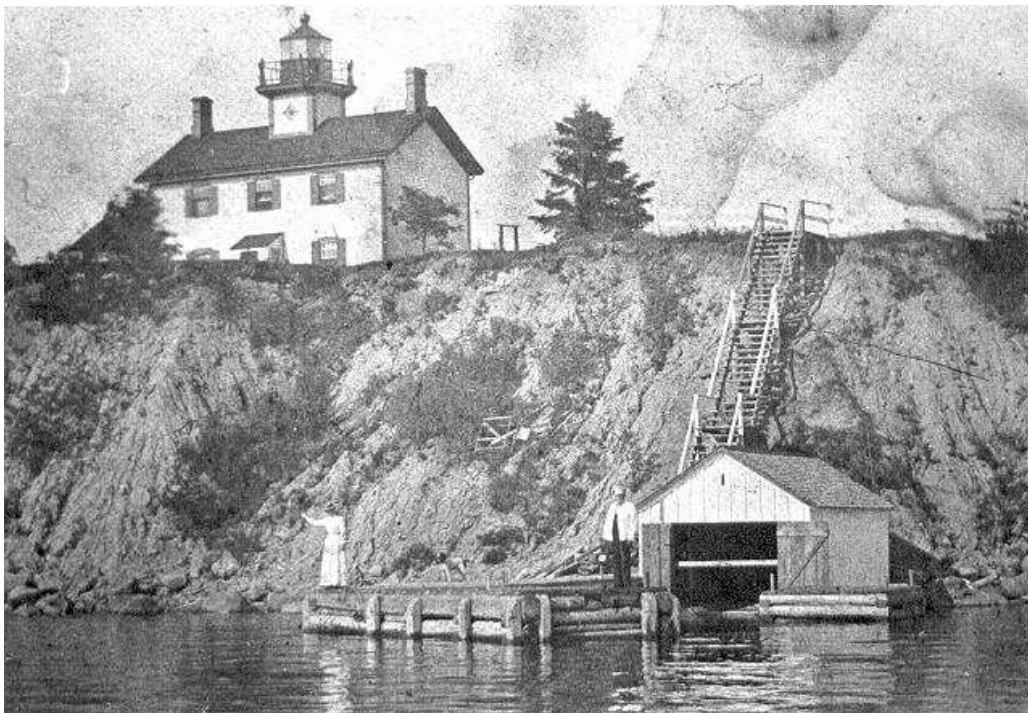


Figure 7. Lighthouse, dock, and boathouse, ca. 1901. Note storm shed on lighthouse entry; small size of dock and boathouse; stairs to bluff, swing to right of lighthouse; and board fence at far right (Lakeshore archives).

<sup>36</sup> *Annual Report of the Lighthouse Board*, 1867 (entry 102) and 1868 (entry 123); Raspberry Island Lighthouse Logbook, July 23, 1872 to December 5, 1939 (hereafter Keeper's Log abstracts), transcribed and available in Historical Files, Apostle Island National Lakeshore Headquarters, Bayfield, Wisconsin, 1877, August 19, 1878; Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 49; Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 142.

<sup>37</sup> Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," 69; *Annual Report of the Lighthouse Board*, 1894 (entry 1269) and 1900 (entry 380).

Additional buildings and structures constructed after initial site development included a barn, built prior to 1886, when it is first mentioned in the Keeper's log, and completely destroyed by wind in July 1890. In 1901, the Lighthouse Service constructed a brick oil building for storage of the volatile kerosene that fueled the light.<sup>38</sup> Though more flammable than lard oil, kerosene was found to burn more cleanly and to provide better illumination. The Lighthouse Service began the conversion from lard oil to kerosene around 1877, and by 1885 kerosene had become the principal lighthouse fuel used nationwide.<sup>39</sup> On July 27, 1880, the Raspberry Island keeper wrote that Captain J. N. Miller, Inspector with the Lighthouse Service, had arrived aboard the U.S. lighthouse tender *Dahlia* with new kerosene lamps for both the dwelling and the light. Captain Miller, the keeper wrote, "left 100 gallons of kerosene and removed the balance of the lard oil."<sup>40</sup> It is not known where the large barrels of flammable kerosene were stored prior to the 1901 construction of the oil building.<sup>41</sup> The oil building was based upon a standard Lighthouse Service design, a reflection of the widespread and rapid construction of these buildings in the late-nineteenth and early-twentieth centuries.<sup>42</sup>

First and foremost, Raspberry Island keepers and their assistants (official and familial) were responsible for making sure that the light was shown each evening from dusk to dawn, throughout the navigation season. This routine changed little in the 85 years of manned operation. Keepers' logs diligently note the first lighting of the lamp – most often in May though on occasion as early as April – and the final extinguishing of the lamp – always in December. Each intervening day, the keeper lit the light at sunset (no later than 7:45 according to Keeper Francis Jacker), and kept the light strong until sunrise.<sup>43</sup>

These duties completed, the keeper and his assistants maintained the station buildings and grounds in anticipation of the annual – sometimes twice annual – (and unannounced, if predictable) Lighthouse Service inspections. "The Lighthouse and everything about it is now in perfect order. I am now awaiting the annual visit of inspector which generally occurs between the 16<sup>th</sup> and the end of the month," Jacker wrote on July 14, 1886.<sup>44</sup> In their logs, keepers frequently itemized chores. The logs display remarkably little variation in the 60-odd years that they were kept with any care. Often station employees simply noted that they had done "all that was necessary." Wood and metal surfaces were painted, whitewashed, or varnished in a ceaseless rotation: first, the lantern; then, the lantern pedestal; followed by the boiler covers; the station boat; the residence interior floors, walls, ceilings, trim, roofs; and concluding with the building exterior walls, window shutters, storms, and roofs. When paint was not being applied, it was being scraped off. (Only once are these descriptions of painting augmented with details of color: on July 20, 1888 the log scribe wrote: "repainted outside of tower and dwelling house this summer according to directions received; viz: walls – white; trimmings – lead-color; lantern –

---

<sup>38</sup> Jacker Diary, July 31, 1890; *Annual Report of the Lighthouse Board*, 1900 (entry 380).

<sup>39</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 34.

<sup>40</sup> Keeper's Log abstracts, July 27, 1880.

<sup>41</sup> *Annual Report of the Lighthouse Board*, 1901 (entry 408).

<sup>42</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 34.

<sup>43</sup> Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," 29.

<sup>44</sup> Jacker Diary, July 14, 1886.

black. Heretofore, the whole was uniformly white.") Historic photographs consistently show an immaculate building. In addition, keepers regularly cleaned all painted surfaces (walls and trim), together with the tower, the stairs, the floors, and the cellar. They also scrupulously polished both the brass or "brightwork" and the lighthouse windows, as befit station function. Machinery was "thoroughly cleansed and over-hauled" with impressive regularity.<sup>45</sup>

Maintenance efforts were not limited to the buildings and structures. Brush and trees continually encroached upon the clearing created by the Lighthouse Service in 1862. Keepers frequently observed that they had been "cutting brush all day," a reference not only to keeping open the trail leading to the sand point, but also to maintaining the clearing and thereby the arc of light cast from the lighthouse into the West Channel.<sup>46</sup> After cutting, the slash was piled and burned – another frequent logbook entry.

Early on, two distinct zones developed within the light station clearing. By 1877 a fence had been erected around the lighthouse and its associated buildings, enclosing an area of about one and a half acres<sup>47</sup> (Figure 8). From 1877 until automation of the light in 1947, some sort of fence enclosed the main building cluster, although the type of fence and its exact configuration appears to have varied. In July 1896 Keeper John Eddy reported construction of a whitewashed fence enclosing the lawn –



Figure 8. View to northeast of lighthouse, ca. 1890. Note board fence visible to left and right of building; plank walkway at front and side of building; and apparent absence of outbuildings behind lighthouse (Lakeshore archives).

likely a replacement/repair of the earlier structure.<sup>48</sup> The earliest known photographs of the lighthouse, taken between 1888, when the building received its two-tone paint scheme, and 1901, when storm sheds were added to the main entry, show a whitewashed four-rail fence east of the lighthouse. The primary purpose of the fence seems to have been to demarcate the domesticated and orderly yard from the rough clearing and the woods beyond. The fact that the fence does not

---

<sup>45</sup> Keeper's Log abstracts, *passim*.

<sup>46</sup> Keeper's Log abstracts, *passim*; May 30, 1910.

<sup>47</sup> Raspberry Island Light Station, Wis. Drawing No 633-80013, copy available at DSC TIC.

<sup>48</sup> Keeper's Log abstracts, July 9, 1896.

appear to have paralleled the edge of the bluff west of the lighthouse strongly suggests that it was not intended as a safety device, despite the fact that several keepers had small children living with them on the island (Figures 9 and 10).

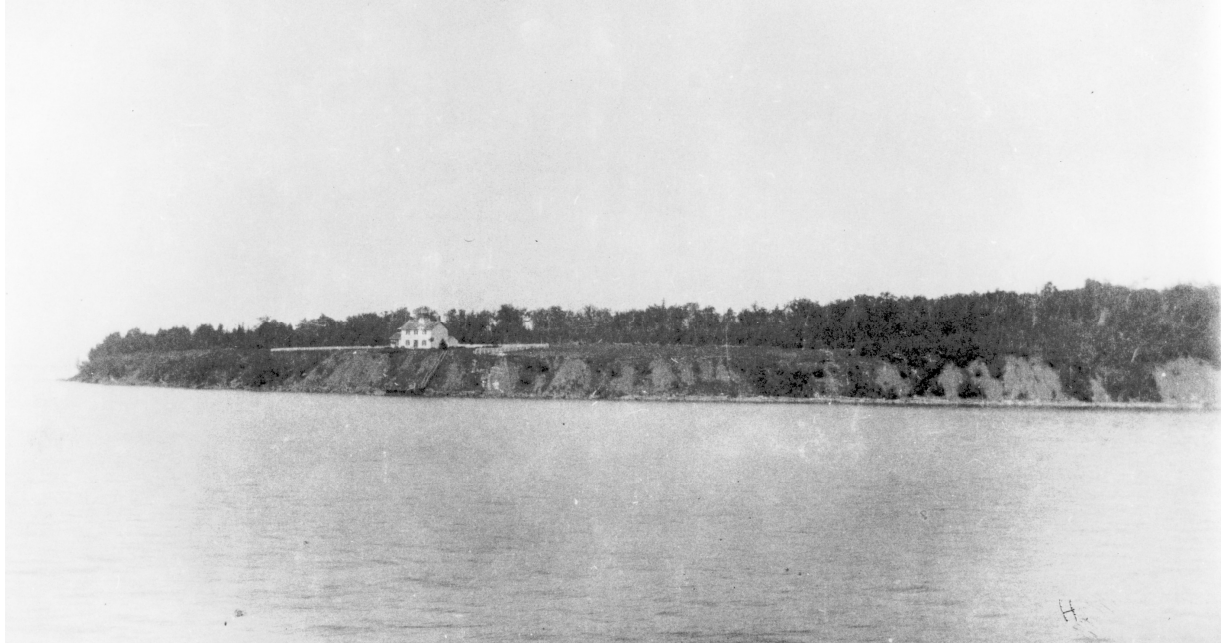


Figure 9. View of lighthouse and station clearing from lake, ca. 1891. Note fence surrounding lighthouse yard and extent of station clearing (Lakeshore archives).



Figure 10. Detail of Figure 9. Note stairs from dock to bluff; fence around yard; absence of a boathouse; and the outbuilding visible at right of lighthouse (Lakeshore archives).

The area within the fence evolved into a formal yard, with constructed pedestrian walks, vegetable gardens, flowerbeds, and lawn. By 1886, a pedestrian “plank way” – perfect, Keeper Francis Jacker said, for a promenade on a clear night – had been constructed, and in 1895 the

Lighthouse Board reported that "some 327 running feet" of this walk had been re-laid with new plank."<sup>49</sup> The location of these walks is unknown, though they presumably linked the lighthouse with the stairs to the dock and with the various outbuildings within the yard. Though perfect for strolling, the plank walks also served a more practical purpose: the light station lies in a level area with a topographic rise behind and a layer of clay beneath the topsoil. The top layers of soil at the site quickly become saturated, muddy, and difficult to traverse. Solutions included not only the plank walks, but also concrete drainage structures that funneled surface water across the grass on the north and south sides of the lighthouse. (Eventually, most of the plank walks were replaced with more permanent concrete walks.<sup>50</sup>)

Lawn surrounded the lighthouse by at least 1894 when the keeper noted a picnic "on the grass" in his log<sup>51</sup> (Figure 11). Beginning in 1896, "cutting the grass" is a frequent notation in the station logs, and "burning grass" on the station grounds appears to have been an annual springtime chore.<sup>52</sup>

Roads and pathways extending beyond the clearing were few. A trail (described by 1907 as a road, see below) led from the station to the dock and boathouse at the sand point. From 1863 until 1868, all materials and goods related to both initial site construction and supply of the station's first keepers were transported along this route. Seasonally, keepers referred to "cutting brush to the E. point" in their logs – a reference to the effort required to keep open the trail to the point.<sup>53</sup>

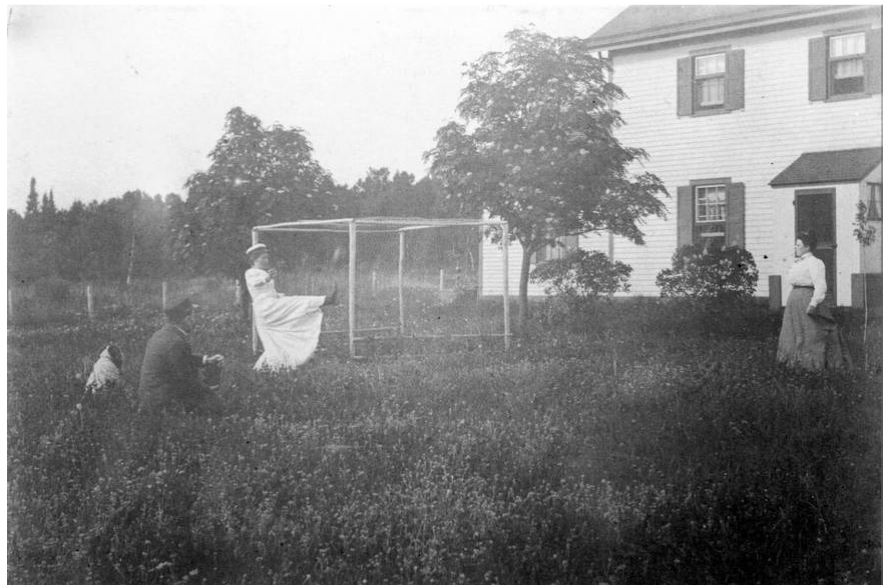


Figure 11. Leisure activity in front (west) of lighthouse, ca. 1901. Note wire fence in background; storm shed on lighthouse entry; and unmown "lawn." The function of the structure behind the woman kicking the ball is unknown (Lakeshore archives).

Other than the trail to the sand point, however, there appear to have been few formal paths on the island during the first development period, and little reason to wander. The native forest, which,

---

<sup>49</sup> Jacker Diary, July 14, 1886; August 22, 1886; *Annual Report of the Lighthouse Board*, 1895 (entry 1269).

<sup>50</sup> This appears to have occurred in conjunction with the rebuilding of the lighthouse in 1906.

<sup>51</sup> Keeper's Log abstracts, August 12, 1894 and May 30, 1901.

<sup>52</sup> Some entries in the Keeper's logs distinguish between grass around the lighthouse and grass growing in the clearing. In others, it is difficult to determine where within the site the keepers were working.

<sup>53</sup> Keeper's Log abstracts, *passim*.



on Raspberry Island, is characterized by a dense understory of Canadian yew, is not easily penetrated, and it appears that other than rough trails used to haul firewood from the forest, activities were concentrated in the vicinity of the lighthouse and the station clearing.<sup>54</sup>

This fact is clearly conveyed in the Keepers' logs, not only in the recitation of daily chores, but also in the careful notation of ships' passage. Official duties and daily maintenance completed, Raspberry Island keepers noted mariners' passage as surely as the mariners watched for the keeper's bright light. In 1877, Keeper Lewis Larson and his assistant keeper and wife Annie Larson, for example, reported that 443 steamers and sail vessels passed the light between July 1, 1876 and June 30, 1877.<sup>55</sup> That number would increase to 483 during the 1878 season. Francis Jacker was less exact yet more descriptive, his diary is replete with references to the names and direction ("upward" or "downward" bound) of passing ships and the time of their passage.<sup>56</sup> These careful counts speak not only to the station's role in the larger maritime culture and economy, but to more practical concerns of land use at the station: passing ships could be seen only from the six-acre light station clearing. The consistently careful count of passing vessels suggests that the keeper and his assistants spent the greater part of each day within the confines of the clearing, the focal point of land use on the island.

At a larger level – one leaving no trace on the physical environment yet speaking to Raspberry Island's relationship to the mainland and the other Apostle Islands – circulation systems included the navigation routes by which visitors made their way to the island. By the 1880s, tourists from Ashland, Bayfield, and beyond were traveling to the island during the summer months, touring the light station and picnicking at the sand point. Other visitors included friends and family of the keeper and the keepers of other Apostle Island lights, who came not only to visit but also to pick berries. Raspberry Island inhabitants returned these visits as time and sailing conditions allowed. That these visits, however, were duly noted may suggest not so much an active social life but rather the degree to which the visits contrasted with the norm, a suggestion sustained by the long weeks in spring and fall when visitors were markedly few. Unlike those keeping mainland stations, island keepers faced lonely duty largely mitigated only by the company of family and assistant keepers, by mail delivery and supply runs, and more fully relieved only when released from duty when ice closed navigation in the lake late in the fall. Some welcomed the isolation: "No boat, no sail, no living soul in sight. This is solitude!" Jacker rejoiced on May 16, 1882, 16 days into his first season as keeper.<sup>57</sup> Others distinctly did not: "I hate lighthouses. They are so lonely," Cecilia McLean remembered in 1931. "We left Raspberry Island in 1916, and I was glad enough to see the last of it."<sup>58</sup>

Beyond responsibility for the safety of passing ships and for maintenance of station grounds and buildings, a keeper and his family were largely responsible for their own subsistence and

---

<sup>54</sup> Keeper's Logs suggest that firewood was hauled on sleighs or wheelbarrows. Ibid., November 24, 1896 and May 8, 1900.

<sup>55</sup> Ibid., July 16, 1877.

<sup>56</sup> Jacker Diary, September 28, 1888.

<sup>57</sup> Ibid, May 16, 1882.

<sup>58</sup> Cecilia McLean, 1931 interview, quoted in Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 11.



amusement. Components of the built environment reflecting the means of meeting these responsibilities varied over time, and included a vegetable garden, a larger plots for potatoes (a commercial as well as subsistence crop), a hay field and grain patch, berry patches, flower gardens, a swing, and, in the second period of development (see below), a croquet ground and horseshoe pits. Throughout the years of historic use, decorative and vegetable gardens and recreation-related resources were located inside the fence, in the immediate vicinity of the station buildings. The timothy hay field and grain plot are presumed to have been located within the clearing, but beyond the yard fence, where sufficient space was available for these land-intensive crops. Wood lots were scattered throughout the island, wood appears to have been harvested in an orderly progression beginning with the area nearest the station and then moving beyond the station to the island interior over time. The principal berry patch appears to have been located at a bog near the sand point.

Keepers' logs are not available for the Raspberry Island station until 1872, and the details of care, maintenance, and use of the station grounds and the island during the first ten years of operation are a matter of conjecture.<sup>59</sup> Gardens had been cleared and planted at the lighthouse by 1879, when the keeper noted in his log that they were damaged by hail.<sup>60</sup> The keeper failed to mention whether these were vegetable or flower gardens, though the former appears most likely. Given the island's fertile soil and relatively temperate climate ("several degrees warmer, on average, than the mainland," according to *The Bayfield Press*), and given the limits to perishable goods included in the "annual supplies" provided by the Lighthouse Service, it is likely that a vegetable garden plot had been cleared and tilled the summer of 1863 and passed to each successive keeper.<sup>61</sup> By the 1880s, the garden had grown bountiful: "Last Saturday the writer received a large box from [Seth] Snow [Raspberry Island keeper], labeled 'specimens,' and upon opening the box discovered a baker's dozen of the largest and handsomest onions we ever gazed upon," the *Bayfield Press* reported in 1882.<sup>62</sup> Jacker, who in addition to the official Keeper's log kept a detailed diary for five seasons (1886 – 1890), raised lettuce, cucumbers, beans, squash, peas, onions, potatoes, rutabagas, pumpkins, and berries – including currants, gooseberries, and raspberries.<sup>63</sup> The garden contents appear to have remained fairly consistent over time. The only crops planted by later keepers not mentioned in Jacker's diary are tomatoes, cabbages, beets, and strawberries.<sup>64</sup>

The location and size of the vegetable garden presumably changed over time. The Keepers' logs rarely provide sufficient detail to locate a garden plot or determine its size. Virtually the only references in the logs that mention new garden plots, or the location of a garden plot are from

---

<sup>59</sup> Lighthouse keepers were required to keep a journal of matters pertaining to their stations. The level of detailed depended solely upon the keeper. The earliest extant entry for Raspberry Island is from July 1872.

<sup>60</sup> Keeper's Log abstracts, July 9, 1879.

<sup>61</sup> *The Bayfield Press*, Vol. 1, No. 26, Saturday, April 8, 1871, 2. Keeper's Logs carefully detail the delivery each July of "annual supplies" via the Lighthouse tender. This delivery appears to have generally coincided with the annual inspection. Keeper's Log abstracts, passim.

<sup>62</sup> *The Bayfield Press*, Vol. 9, No. 6, Saturday, Dec. 2, 1882, 1. In this reference, Snow is identified as the keeper at Sand Island.

<sup>63</sup> Jacker Diary, passim.

<sup>64</sup> Keeper's Log abstracts, June 20, 1896, May 29, 1902, and April 24, 1905.

1902, when the log mentions that the west garden, presumably located in front of the lighthouse, was planted in potatoes, and in 1904, when the keeper dug up new ground, in an unknown location, for a potato garden.<sup>65</sup> Resources constructed in association with vegetable production included not only the garden sites, but a "root house," in an unknown location, used to store potatoes in 1896 and a "potatoe [sic] pit dug on the north side of the house" in November 1900.<sup>66</sup>

In addition to vegetable gardens, keepers also maintained flower gardens. As with the vegetable gardens, the location and size of these plots have not been determined, but flower gardens were established as early as 1882 when *The Bayfield Press* again thanked Snow, this time not for onions but for a "beautiful bouquet of flowers."<sup>67</sup> Although the reporter failed to embellish his thanks with descriptions of flower variety, he would later note Snow's delivery of pansies and "pinks" (*Dianthus*).<sup>68</sup> Rose bushes, transplanted from Bear Island by Assistant Keeper John McMartin, were planted by at least 1900, with additional bushes added in subsequent years.<sup>69</sup> Seth Snow's successor, Francis Jacker, reported two small lilac trees in bloom in front of the house ("clusters of a creamy white and their odor resembles that of saffron").<sup>70</sup> In 1902 the Keeper's log noted the presence of flower gardens on the east side of the house.<sup>71</sup>

The island provided abundant wild strawberries, raspberries, currants, pin cherries, sand cherries, and cranberries. In a typical year, strawberries first ripened in early June and continued to attract visitors to the island until the middle of July. Given the island's dense vegetation, these strawberry patches are presumed to have been located within the light station clearing (though beyond the yard fence) and in other natural clearings. As the strawberries waned, the native raspberries came on – also attracting visitors from the mainland: "Boutin and family [of Raspberry Bay] were here picking raspberries. Also a man half-breed (Antoine Occoteau) and wife, the first Indian visitors on the island. They came from beyond the point opposite York Island," Jacker reported in July 1886, in a typical entry. The marsh cranberries growing near the sand point ripened in September with the first frost. One description of a berry harvest suggests that the light keepers considered the entire Raspberry Island reserve their larder, to be shared with friends and acquaintances at the keepers' discretion, and confirms that their use of the island extended beyond the immediate vicinity of the light station. Jacker wrote:

When going to the marsh I found two men there picking the cranberries which J. Boutin had left. They had scoop shaped combs made for the purpose of picking cranberries and had gathered between 3 and 4 bushels. They said they picked here before, two years ago. After telling them that I wanted to save these berries for my own folks, one of them was

---

<sup>65</sup> Ibid., May 8, 1902 and October 29, 1904; Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," p. 33.

<sup>66</sup> Keeper's Log abstracts October 21, 1896 and November 11, 1900.

<sup>67</sup> *The Bayfield Press*, Vol. 8, No. 28, Saturday, May 6, 1882, 1. It is instructive to note that there is no mention of flower gardens in the Keeper's Log until 1900, though it seems clear from this newspaper report that flowers were grown at the station as early as 1882.

<sup>68</sup> *The Bayfield County Press*, Vol. 11, No. 51, Saturday, Oct. 10, 1885, 1.

<sup>69</sup> Keeper's Log abstracts, May 27, 1900 and April 24, 1903.

<sup>70</sup> Jacker Diary, June 22, 1887.

<sup>71</sup> Keeper's Log abstracts, April 14, 1902.

going to stop, but the other kept on picking. This aroused my temper and I spoke to him a little mad, whereupon he asked if this marsh belonged to the 'Lighthouse reserve'. 'Yes, the whole island,' I said. 'I didn't know that,' he replied, but I think both of them knew.<sup>72</sup>

Wild game provided an additional food source in the form of rabbits, plentiful in those years when the fox population was small and largely absent in years when fox were abundant. Fish, gathered both in fixed nets and by line, as well as ducks, were also available. Deer were hunted on Oak Island.<sup>73</sup>

What fresh food they could not grow or gather, island inhabitants brought with them or secured from farmers on the mainland. In 1882, Keeper Snow again impressed a *Bayfield Press* reporter when he presented "ye scribe" with a "a huge chicken (as large as a fair sized turkey) and a pail of eggs." Snow made a similar offering in October 1885.<sup>74</sup> Jacker also raised chickens, both roasting and laying hens, noting their skill at hiding from the chicken hawks that would have them for supper before Jacker was able to do the same.<sup>75</sup> In November 1894, second assistant Keeper Abram Hirwas left the island for the season with his "trunks & chickens."<sup>76</sup> The earliest reference to a chicken house is found in Jacker's diary from 1890. The location of this structure, as well as its date of construction is unknown.<sup>77</sup> Jacker is known to have secured his milk from "The Norwegian's" on Raspberry Bay, a pleasant sail in fair weather from Raspberry Island.<sup>78</sup> Others may have done the same.

In addition to foodstuffs, firewood for the wood-burning cook stove in the keeper's residence was cut from the island. In June 1886 Jacker wrote, "the weather is so cool that I have to make fire in the house every day, though in the bush it's quite warm" and in October of that same season he lamented that his daughters rather than his sons were coming to visit: "Madeline and Sarah will be here sometime this week. I wished one of the boys would come to cut some firewood."<sup>79</sup> Keeper John Eddy or his assistants were particularly diligent about recording wood-cutting efforts, their log replete with the notation "bringing in wood from the woods," a chore pursued, according to the log, on average every few days from September through November, 1896 and 1897.<sup>80</sup> In the first years of island habitation, wood was cut near the house (Figure 12); as these nearby areas were depleted, island residents ventured inland, cutting trails to haul wood by sleigh or wheelbarrow, or boating it to the station (see below).

---

<sup>72</sup> Jacker Diary, September 14, 1890.

<sup>73</sup> See for example Keeper's Log abstract, September 11, 1900, November 15, 1904; Jacker Diary, May 17 and May 20, 1885; Marjorie Benton interview, 1989, Vertical files, keeper/people file, Lakeshore Library.

<sup>74</sup> *The Bayfield Press*, Vol. 8, No. 15, Saturday, Jan. 28, 1882, 4. *The Bayfield County Press* Vol. 11, No. 51 Saturday, Oct. 10, 1885, 1.

<sup>75</sup> Jacker Diary, October 13, 1890.

<sup>76</sup> Keeper's Log abstracts, November 13, 1894; Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 181. The log spelling is "Hirwas." Snyder identifies the 1894 Assistant keeper as Abram Hirwas.

<sup>77</sup> Jacker Diary, September 8, 1890.

<sup>78</sup> Ibid., August 21, 1887, September 8, 1887.

<sup>79</sup> Ibid., October 4, 1886.

<sup>80</sup> Keeper's Log abstracts, August 1896-December 1896 and August 1897-December 1897.

Figure 13 shows the condition within the Raspberry Island Light Station clearing at the end of the first development period. Land cleared of timber and brush supported timothy hay and grain crops. By August 1886, Jacker had nearly two tons of hay in the barn, laboriously gathered “with poor tools,” with another ton awaiting harvest.<sup>81</sup> (Five years earlier, *The Bayfield Press* estimated that the hay crop on the “fine grass lands” at La Pointe averaged over two tons per acre, providing a rough gauge of the size of the Raspberry Island hay field.)<sup>82</sup> In subsequent summers, Jacker chose not to harvest the hay, but rather sold it uncut to A. Decoteau, Decoteau’s brother-in-law, and their families. This arrangement provided not only additional income for the keeper, but also company and diversion: “they make the place quite lively,” Jacker wrote.<sup>83</sup> Harvest of the hay, however, may have been erratic. From Jacker’s departure in 1891 until July 1902, when Keeper Charles Hendrickson reported that he “raked hay and put in stack,” the Keepers’ logs make no mention of hay production.<sup>84</sup>

Additional open land in the clearing was planted, at least briefly, in grain crops: in 1881 Seth Snow delivered “very fine specimens of barley and oats to the editors of the *Bayfield Press* (who reported “they cannot be bettered in the State.”)<sup>85</sup> This is the only reference to grain crops grown at Raspberry Island. Whether these grains were raised for sale, or as a means of sustaining island livestock is not clear. The few livestock on the island would have found abundant live feed in the station clearing, requiring supplemental feed only in the early spring and late fall.



Figure 12. Cutting wood in the surrounding forest, ca. 1906. View to south. Note wheelbarrow used to haul wood; remodeled lighthouse in rear (Lakeshore archives).

<sup>81</sup> Jacker Diary, August 4, 1886.

<sup>82</sup> *The Bayfield Press*, Vol. 7, No. 40, Saturday, July 23, 1881, 1.

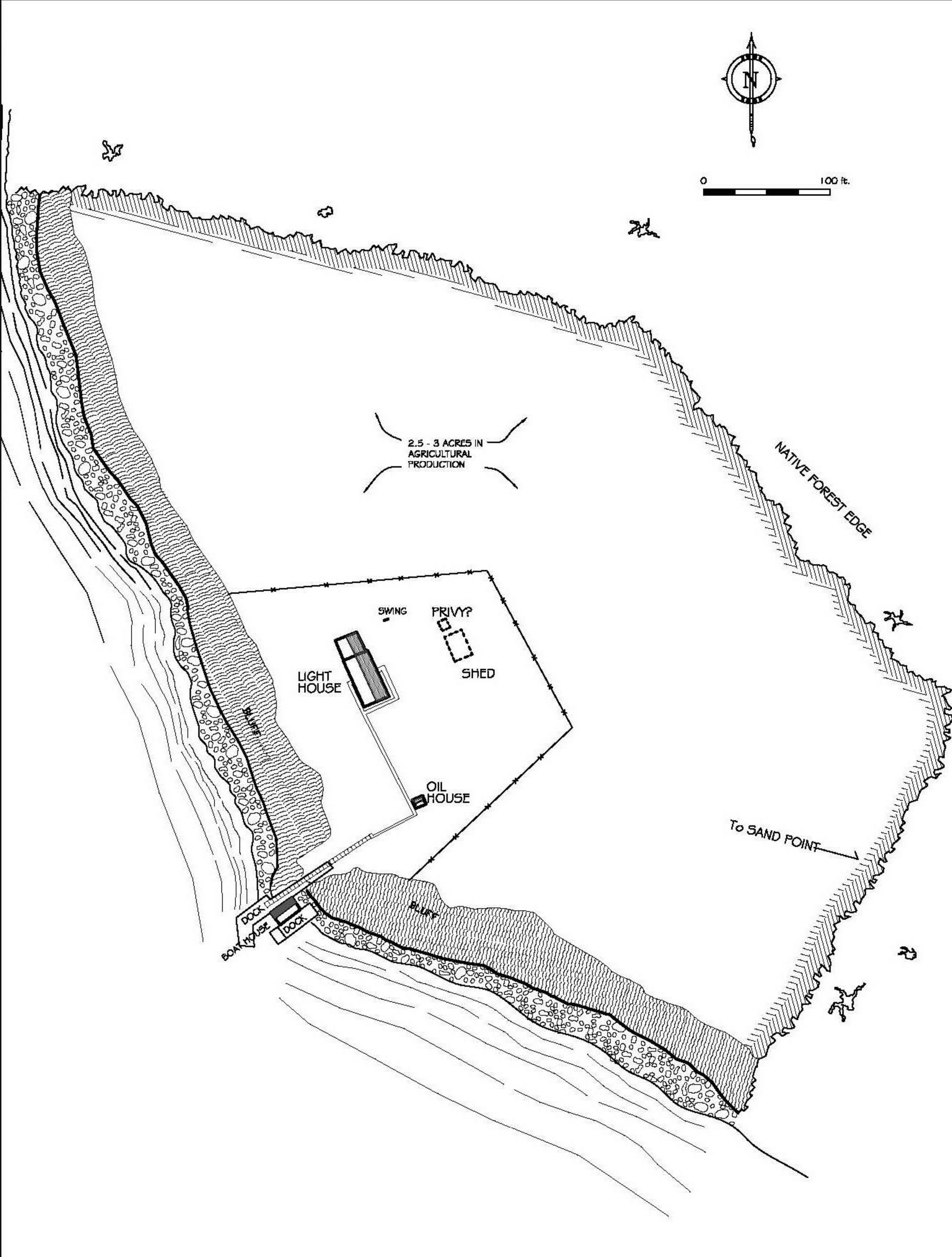
<sup>83</sup> Jacker Diary, August 6, 1887.

<sup>84</sup> Keeper’s Log abstracts, passim.

<sup>85</sup> *The Bayfield Press*, Vol. 7, No. 40, Saturday, July 23, 1881, 4.

INSERT 11x17 MAP

Figure 13. Raspberry Island Historic Base Map: 1859-1901.



## Expansion of Station Facilities: 1902-1938

The second phase of development at Raspberry Island Light Station was initiated by plans to add a fog signal to the station. On January 8, 1902, the Lighthouse Board inquired as to the advisability of establishing a fog signal on Raspberry Island. Raspberry Keeper Charles Hendrickson wrote that during his two years of experience at the station "a fog signal would have been of very much service to the navigation, there is [sic] times when vessels in this fog and out of their course have been asst. by me blowing the fog horn or using the megaphone, though, cases of that kind is [sic] very few." Construction of a steam-powered fog signal, consisting of a ten-inch steam whistle audible for seven miles, was authorized in early 1902.<sup>86</sup>

The amount of shipping passing between Raspberry Island and the mainland was deemed to be of sufficient volume to warrant construction of the fog signal. The signal would aid navigation in storms and fog – "paint white" a Raspberry Island keeper called it – as well as through the dense drifting smoke caused by forest fires that ravaged the tinder-dry slash-filled logged landscape of both the islands and the mainland.<sup>87</sup> In August 1878, for example, *The Bayfield Press* reported that, "a forest fire on Bass Island has illumined the sky for several nights, and filled the atmosphere with a dense, murky smoke." The Raspberry Island keeper noted "big" fires on York and Sand Islands in September 1896, such that "a steam barge got over in Raspberry Bay [outside the West Channel]. Could not see anything for smoke."<sup>88</sup> Light station logs from the period of most intensive logging, between 1870 and 1918, often include the notation "Sounding for Smoke," the atmosphere over the Lake being "as thick as in a fog." "Sounding" was accomplished by means of a fog horn blown by the keeper or an assistant. On occasion the keeper and his assistants hailed or "spoke" passing vessels, and upon at least one occasion they warned off a vessel by firing a gun.<sup>89</sup>

Reflecting the interrelation between the station's working systems and its domestic infrastructure, historians Männikkö and Mackreth report, "the addition of fog signals to stations brought about a cascade of changes."<sup>90</sup> At Raspberry Island, these changes began during the summer of 1902, when the Lighthouse Service ordered construction of a new dock, inclined wood tramway, and hoist at the station. These improvements would be used to haul building supplies and equipment for the fog signal directly to the top of the bluff, eliminating the need to transport this material over the path from the sand point. The new dock included two cribs, the longer crib to the left of the dock and a shorter crib to the right.<sup>91</sup> In September 1902, a month appropriately marked variously by fog or smoke, the tender *Amaranth* discharged multiple loads of lumber and brick at

---

<sup>86</sup> Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 61-63.

<sup>87</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 26.

<sup>88</sup> *The Bayfield Press*, Vol. 3, No. 47; Vol. 2, No. 12 Wednesday, Aug. 28, 1878, 1; Keeper's Log abstracts, September 23 and 27, 1896.

<sup>89</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 26; Keeper's Log abstracts, passim, August 27, 1886, and September 27, 1896. Note that the view of Sand Island was a frequent gauge of the severity of the fog (see for example, Keeper's Log abstracts, Oct. 10, 1896).

<sup>90</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 27.

<sup>91</sup> Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," 69.



the dock. The two boilers for the fog signal were delivered on June 5, 1903, and on June 9 and 10, construction crews removed "trees in the way of the fog-signal building" and began pouring the building foundation. The building was completed by the end of July and contained a large central room housing the two boilers and their associated engines and a second, smaller room identified as the "coal bunker," but thought to have also been used to store cords of "signal wood." The hoist



Figure 14. View to south of lighthouse and fog signal building, ca. 1903. Note access to cellar beneath kitchen wing at left (Lakeshore archives).

engine occupied a small (roughly 9 feet square) attached structure, accessible only from the exterior, at the south end of the building.<sup>92</sup> On August 8, 1903, Raspberry Island Keeper Hendrickson wrote "the 10-inch steam whistle at this Station has today, for the first time, been sending its sound over Lake Superior."<sup>93</sup> The Lighthouse Service Office of the Inspector ordered that the signal be sounded in blasts of 3 seconds' duration, separated by silent intervals of 17 seconds, during times of "thick weather"<sup>94</sup> (Figure 14).

The fog signal operated on the same principles as a steam locomotive whistle. Water for the boilers was obtained from the lake. A siphon on the dock below the fog signal building delivered water to a buried cistern located immediately west of the fog signal building (Figure 15). Water lines, encased in wood to protect them from the weather, led into the building. To operate the signal, keepers had to fire the boilers and then monitor the steam pressure.<sup>95</sup> In addition, the keepers had to unload and store the coal used for the signal, cut, haul and store firewood used as auxiliary fuel, and maintain the building and its equipment in good working order.<sup>96</sup> These duties were added to an already full schedule. In September 1903, the Raspberry Island keeper and his assistant logged untold hours "painting and cleaning in fog signal," "painting No. 2 engine,"

<sup>92</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 31.

<sup>93</sup> Keeper's Log abstracts, Aug. 8, 1903.

<sup>94</sup> *Ibid.*, Sept. 3, 1903.

<sup>95</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 28.

<sup>96</sup> The July 1903 Keeper's Log, for example, includes the notations "Pulled some logs from the Lake up on the dock for wood, for fog signal use" and "Started to cut some wood for fog signal today." In September 1903 the keeper wrote, "Put wood in fog signal house."



"[making] a closet in fog signal for paint buckets," "working in hoisting engine," "split[ting] wood for signal" – all in addition to their other duties.<sup>97</sup> In November 1903, station duties again increased when a stove was added to the fog signal building to prevent the water lines required by the boilers and steam engines from freezing, and again in the spring of 1904 with the need to repair frozen water lines



Figure 15. View to southwest of fog signal cistern, date unknown. Note hand pump; boxed-in waterline between cistern and fog signal building; and wood tramway at rear (Lakeshore archives).

between the cistern and boilers, repair leaky flues, and assure adequate water pressure added to an already hectic season.<sup>98</sup>

The work required to operate and maintain the fog signal overtaxed the abilities of the keeper and his assistant. In 1904 a desperately needed second assistant keeper was assigned to the station.<sup>99</sup> The assignment of additional staff to the station necessitated provision for additional quarters and, in turn, increased the demands placed upon the station gardens and island woodlots.

One of the ramifications of the addition of the fog signal was an increase in woodcutting. In December 1905, the Raspberry Island keeper reported that 25 cords of firewood, and another 15 cords of [fog] signal wood, were on hand.<sup>100</sup> While most often the keepers did not distinguish between the two, log entries after 1903 were more likely to differentiate between the harvest of hard wood – hot burning and best for the signal fire – and soft wood – adequate for the kitchen fire. In the years after the fog signal addition, the keepers also began to suggest in their logs that the forest closest to the house had been depleted. In September 1905, the keepers "made a new road to the bush to get out the hardwood this fall."<sup>101</sup> Wood was also more often gathered on the

<sup>97</sup> Keeper's Log abstracts, September 1903.

<sup>98</sup> Ibid., November 7, 1903 and May 1904, *passim*.

<sup>99</sup> The May 1907 Keeper's Log provides a telling description of the work generated by the fog signal. Keeper Charles Hendrickson found himself alone on the island for 15 days, the second Assistant not yet assigned and first Assistant Charles Price and his wife off the island at Price's father's sickbed. "If fog should set in, the Keeper will have a bad time of it," Hendrickson wrote on May 19. Price and his wife returned on May 20 and the first fog of the season was reported on the 22nd. Ibid., May 4, 1907-May 22, 1907.

<sup>100</sup> Ibid., December 1, 1905.

<sup>101</sup> Ibid., September 1905.

beach or cut at distant points on the island and floated to the station dock where it could be hoisted to the bluff by means of the tramway.<sup>102</sup>

The increased demand for firewood may have provided the impetus for construction of a new woodshed (presently designated shed #2), with an earthen floor, in 1904. The Keeper's log notes that the old wood shed was moved "behind the new shed."<sup>103</sup> In December 1904 a window was placed upstairs in the shed, which identifies the building as that located between the two privies and currently identified as "the shed."<sup>104</sup> It is not known how long the old wood shed survived, but in May 1905 the Keeper's log records the construction of a smokehouse "back of" the old woodshed."<sup>105</sup>

Three years after the addition of the fog signal, the original Raspberry Island lighthouse, with quarters for a keeper and assistant keeper, was reconstructed to incorporate two apartments for the assistant keepers and enlarged living space for the keeper and his family. In a petition to the Lighthouse Board for the requisite approval and funding of this work, 11<sup>th</sup> District Engineer Charles Keller wrote:

Raspberry Island Light Station is at present provided with a frame dwelling for a keeper, to which the tower is attached. The structure was erected in 1862, and will accommodate one family and an unmarried assistant. Since its construction, a fog signal has also been erected at this station, and a keeper with two assistants assigned to it. . . . With a view to providing a dwelling which shall be suitable for the number of keepers actually stationed at Raspberry Island, there have been prepared in this office plans for converting the dwelling into a double house, providing room for two families and one unmarried assistant. The plans are forwarded in a separate enclosure, and their approval by the Board is requested as well as authority to perform the work by day's labor . . . this method being considered most economical and advantageous to the government.<sup>106</sup>

The alterations involved construction of an addition to the dwelling, removal of the original tower, and construction of a new tower at the west edge, rather than in the center of, the building. The south half of the building housed the keeper and his family, while the first and second keepers lived in two apartments in the north half of the building. The new tower incorporated the original lantern and the building echoed the original design features: clapboard siding, wood construction, and roughly square plan. On the interior, the expansion is clearly shown on the second floor, where the orientation of the floorboards changes from north-south in the original rooms to east-west in the addition, in the attic floor joists, and in the basement where a section of the original foundation wall remains exposed<sup>107</sup> (Figure 16).

---

<sup>102</sup> Ibid., passim.

<sup>103</sup> Ibid., July 3, 1904, August 25, 1904, August 31, 1904, September 6, 1904.

<sup>104</sup> Ibid., December 2, 1904.

<sup>105</sup> Ibid., May 27, 1905.

<sup>106</sup> Keller to Lighthouse Board, November 15, 1905, quoted in David L. Snyder, "Raspberry Island Light Station, A Lighthouse Odyssey, Part II," *The Keeper's Log*, Vol. XII, No. 4 (Summer 1996), 7.

<sup>107</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 7, 25 .



Figure 16. View to northeast of lighthouse, ca. 1906. Photo taken shortly after completion of remodeling. Note concrete walks; keeper's privy just visible at right rear (Lakeshore archives).

In May 1906 the keepers moved to a "temporary house," probably the existing barn. In October they moved back into the dwelling.<sup>108</sup> The reconfiguration of the lighthouse necessitated by the assignment of a second assistant keeper to the station to help with the increased workload that resulted from construction of the fog signal, also led to changes and additions to some of the ancillary buildings at the site. The existing barn was likely built during this period and may have served as temporary quarters for the keepers. A log entry from October 1906 records moving "the kitchen outfit from the old shed to the new barn."<sup>109</sup> A May 1907 entry refers to painting the wood shed, watercloset, and carpenter shop, the first reference in the logs to this later building.<sup>110</sup> The location of the carpenter shop is unknown, though it may be the building presently referred to as shed #1. It is certain that this building has served a variety of uses over the years (Figure 17).

<sup>108</sup> Keeper's Log abstracts, May 21, 1906, October 9, 1906.

<sup>109</sup> It is unclear why "the kitchen outfit" would have been moved to the barn, since the newly remodeled lighthouse provided kitchen space in each of its three apartments. Ibid., October 8, 1906.

<sup>110</sup> The reference to the watercloset, or privy, is singular, perhaps suggesting that only one privy existed at this date. A 1909 log entry refers to outhouses. It is possible that a second privy was built during this period, necessitated by the presence of the second Assistant keeper on the island. Ibid., May 16, 1907, July 6, 1909.

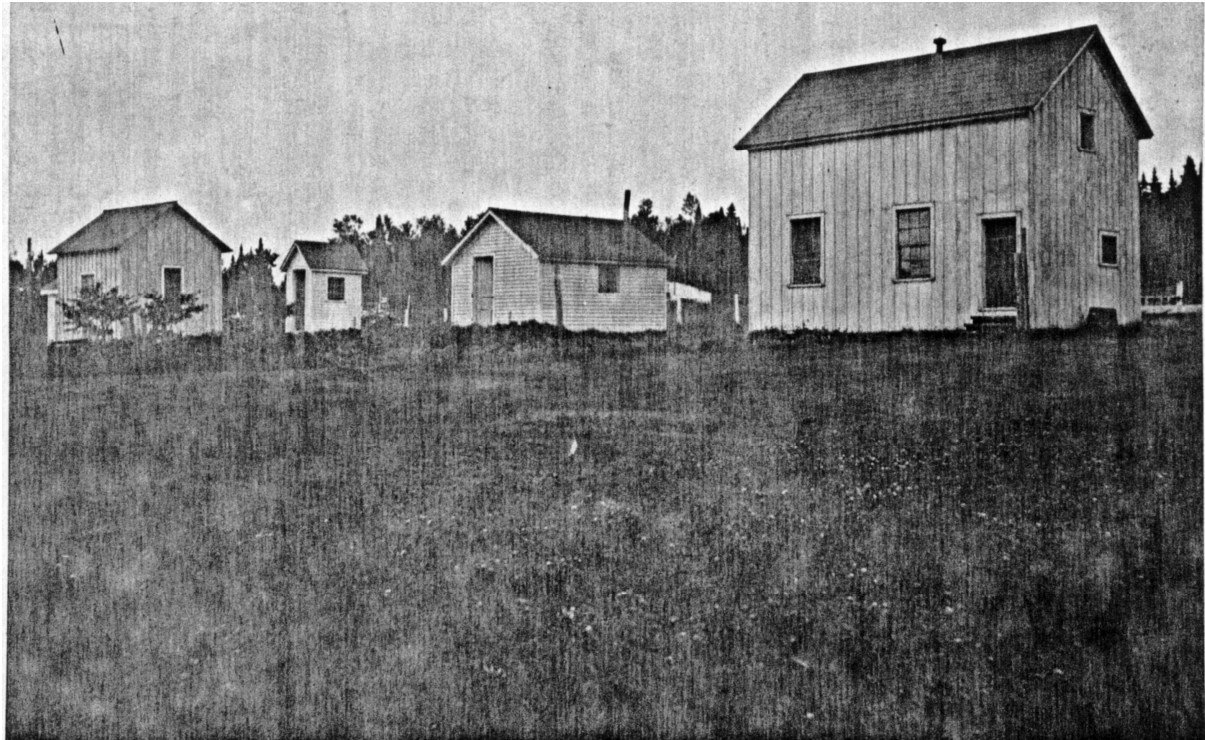


Figure 17. View of station outbuildings, date unknown. From left to right: assistant keeper's privy (just visible); shed #2; keeper's privy, shed #1, and barn. Note stove pipe projecting from roof of shed #1; clothesline to rear of outbuildings; apparent wire yard fence; and absence of obvious paths and walks (Lakeshore archives).

There is evidence that even these expanded living arrangements proved inadequate, particularly when one of the assistant keepers had a family.<sup>111</sup> A 1913 log entry states that the second assistant had "set a cookstove upstairs in the warehouse to do his cooking," suggesting some domestic use of the barn. In 1916, log entries reference painting "the 2nd Assistant's shack," the first known reference to this building, which may be the carpenter shop referred to in 1907.<sup>112</sup>

While the keeper and his assistants were kept busy with the maintenance and operation of the navigational aids, they also continued the tradition of growing garden truck and livestock fodder, and keeping domestic livestock. In October 1909 newly appointed Keeper Alexander McLean, who brought his wife and children to the island near the end of the 1909 season, "commenced building a cow stable of logs," the first reference to a milk cow on the island.<sup>113</sup> In December,

---

<sup>111</sup> Although many employees brought their families to the island for part of the year, some occupied the station by themselves. In later years, school-aged children left the island in September to attend school on the mainland.

<sup>112</sup> Keepers used different names for the same building over time, depending upon the then use of the building. For example, the barn/warehouse, is variously referred to, over time, as a barn, a shop, and a warehouse. This complicates definitive identification of individual buildings. Quoted in Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 28; Keeper's Log abstracts, May 13, 1916.

<sup>113</sup> *Ibid.*, October 15, 1909.

McLean turned his attention to the construction of a whitewashed chicken coop. The buildings first served their purpose in May of 1910 when McLean "brought a cow and chickens to the station,"<sup>114</sup> a tradition that he continued through at least the 1913 season. The next reference to a cow on the island is from the log entry of May 16, 1932, when the tender *Amaranth* landed a cow at the sand point for the first assistant keeper.<sup>115</sup>

Keepers' logs also reference a horse on the island during some summers. The first log reference to a horse on the island occurs in 1916, when the keeper of the Devil's Island light kept his horse at Raspberry for "a couple of weeks;" whether it worked for its board is unknown.<sup>116</sup> The Devil's Island keeper appears to have continued to board a horse at Raspberry during the summers of 1918 and 1919.<sup>117</sup> Between 1924 and 1929 a horse belonging to the 1st assistant keeper boarded on the island and was used to "to plow garden and later on to haul wood" (Figure 18). At the end of each season a raft was constructed to carry the animal back to the mainland. In 1927 an existing structure on the island was rebuilt as a horse shed or stable using "balsam poles" cut on the island<sup>118</sup> This shed or stable may represent a new structure or a reuse of the 1909 "log cow stable." There are no log buildings on site today, and the location of the stable is not known.

Available documents do not clearly describe the location, size, or content of the vegetable gardens during this period. With few exceptions the logs establish only that a vegetable garden was present and that its tending absorbed many hours during the course of the growing and



Figure 18. View to north of horse in vegetable garden, date unknown. This garden appears to be in the approximate location of the reconstructed vegetable garden, south and east of the lighthouse (Lakeshore archives).

---

<sup>114</sup> Ibid., May 13, 1910.

<sup>115</sup> Ibid.

<sup>116</sup> Ibid., November 12, 1916.

<sup>117</sup> Ibid., November 25, 1918, October 28, 1919.

<sup>118</sup> Ibid., passim.

harvest seasons (Figure 19). In one of these exceptions, a 1905 keeper describes clearing and planting a domestic strawberry patch, auxiliary to the abundant native strawberries on the island.<sup>119</sup>



Figure 19. View to north of gardens, August 1922. Note vegetable garden to right; cinder path leading to barn in foreground; and flower beds bordered with painted stones (Lakeshore archives).

Similarly, details regarding the quantity and storage of hay are lacking. Hay continued to be harvested on the island in the period between 1902 and 1932, with crops reported in 1902, 1905, 1918, 1926, 1928. The record of hay production does not necessarily correspond to the years when the island is known to have supported a milk cow or work horse (1910-1913; 1918, 1919; 1924-1929; 1932). This is suggestive of the gaps and omissions that characterize the logs. It seems likely that hay was cut throughout this period, particularly during those seasons when livestock lived on the island. The mention of hay cutting in the logs may only reflect surplus production that was available for commercial sale, or may represent nothing more than the idiosyncratic nature of the log keeping for activities not directly related to the operation and maintenance of the light and fog signal.

Construction of the fog signal building and remodeling of the lighthouse necessitated at least some modifications to the station's circulation systems, although those systems continued to follow patterns established during the initial development period. The station dock below the lighthouse and the landing at the sand point continued to provide access to and from the island. The 1902 construction of the tramway in anticipation of the fog signal building, likely ensured

---

<sup>119</sup> Ibid., April 22, 1905.

more intensive use of the station dock, since it greatly reduced the amount of labor required to haul supplies and equipment up the bluff to the station (Figure 20).



Figure 20. View from lake, ca. 1906. Note wood tramway at right; apparent wire fence (white-painted fence posts); and sewer/drainage lines on bluff face to left of lighthouse and below fog signal building. Outbuildings are visible to the rear of the lighthouse and fog signal building (Lakeshore archives).

The trail to the sand point remained the most used of the island's trails and was occasionally referred to in the station logs as a "road," indicating its importance and frequency of use. Additional trails into the island's interior, presumed to have been of low standard and intended for only temporary use, were used to haul wood used for fuel or building.

One substantial change to the island's circulation system occurred in 1921, with the establishment of a trail leading from the station clearing to an overlook point near the northwest tip of Raspberry Island. In 1921 the Lighthouse Service installed an acetylene burner at the Sand Island station, regulated by a valve that opened or closed with the heat of the sun. The Sand Island keeper's position was then discontinued, and responsibility for maintaining the burner fell to the Raspberry Island keepers – as did the nightly mile walk on the new "north trail." From the overlook point at the end of the trail, the keeper could see beyond York Island to Sand Island and could confirm that the beacon was lighted.<sup>120</sup>

Within the lighthouse yard walkways connected most buildings. There are frequent references in the logs to cutting the grass from the side of the walks, which appear to have been largely wood walkways consisting of planks laid atop wood stringers, until the reconstruction of the lighthouse building in 1906. The reconstruction of the lighthouse necessitated both new walkways and replacement of existing walks. A photograph taken in the fall of 1906, shortly after completion of the lighthouse alterations, clearly show concrete walks leading from the vicinity of the fog

---

<sup>120</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 27. When Sand Island was not visible from Raspberry Island the keeper relied upon notice from mariners and the Lighthouse Service that the light was not functioning. In August 1927, the log noted: "received mail and notice of Sand Island being out at 5:30 P.M. Left at 6 P.M. for Sand Island. It was too rough to land gas tanks there. Found the gas at Light all exhausted."



signal building to the front (west) and rear (east) sides of the lighthouse, and from the rear of the lighthouse to towards the wood shed and the keepers' privy (Figure 21). The first log reference to cement or concrete sidewalks is found in 1909 and, as with so many previous entries, refers to cutting the sod away from the walk<sup>121</sup> (Figure 22). References to concrete walk repair and reconstruction include mention of hauling gravel from the sand point, possibly for use as a component in the concrete mix.<sup>122</sup>



Figure 21. Rear (east) façade of lighthouse, ca. 1906. View taken after completion of remodeling. Note simple flagstaff in front (west) of lighthouse; concrete walkways; and wire yard fence gate. The tree behind the lighthouse and the two large rocks beside the walkway are no longer extant (Lakeshore archives).

Some wood walkways survived on the site. A description of the station prepared by the Lighthouse Service in August 1910 states that "concrete walks have been built in front of the dwelling and to the fog signal and oil-house. Wooden walks connect the outhouses with each other and the dwelling."<sup>123</sup> The second sentence in this quote is problematic, since it appears that the only wood walks extant by this date linked the assistant keeper's privy to a cement walk near

---

<sup>121</sup> The 1906 photograph can only have been taken from the barn/warehouse, which confirms that this building existed in 1906. Keeper's Log abstracts, July 2, 1909.

<sup>122</sup> Ibid., passim.

<sup>123</sup> 9th Light-House District, "Description of Buildings, Premises, Equipment, Etc., at Raspberry Island Light-Station, Wisconsin" (27 August 1910). Typescript on file at Lakeshore Library.



shed #2 and, possibly, connected shed #1 to the barn. A photograph from the 1920s clearly shows a wood walkway extending from the end of the cement walk in front of shed #2 towards the assistant keepers' privy and a second wood walkway alongside the north side of shed #2, leading towards the area occupied by the station's clothesline (Figure 23).<sup>124</sup> A cinder walk, first noted in 1917, but probably dating from ca. 1906, appears to have extended from the vicinity of the oil building to the barn.<sup>125</sup> This walk is clearly visible in a photograph from 1922 (Figure 24).



Figure 22. View to north of front (west) lawn of lighthouse, ca. 1920s. Note height of concrete walkway above grass; wire yard fence (painted cedar posts); and flower beds. This view shows the beds before they were bordered with painted stones (Lakeshore archives).

---

<sup>124</sup> Vestiges of the wood walkway are still visible in the grass immediately in front (west) of the Assistant keepers' privy, but this remnant appears to lead at an angle towards the end of the cement walkway by the woodshed, while the 1920s photograph depicts this walkway as extending directly west from the privy and then turning south at a right angle to connect to the cement walk. It seems likely that the extant remnant dates from 1931, when the log notes construction of a new walk to the Assistants' toilet. Keeper's Log abstracts, September 4, 1931.

<sup>125</sup> Ibid., June 25, 1917.



Figure 23. Harold Benton (son of Keeper Lee Benton) in front (west) of shed #2, ca. 1920. Note cement walk high above surrounding grass; plank walkway leading to assistant keeper's privy and alongside shed #2 to clothesline area; wire yard fence; and extent of station clearing beyond the fence (Lakeshore archives).



Figure 24. View to north of gardens, August 1922. Note flagstaff with topmast and gaff; flower beds outlined with painted stones; cinder path to barn in foreground; vegetable garden to right; and swing behind vegetable garden (Lakeshore archives).

References to recreation in the Keepers' logs and other official records are rare, yet historic photographs and an occasional log entry indicate that life on the island was not all work. The decorative flower gardens are presumed to have been a source of pleasure. Berry-picking excursions are described in the Keepers' logs as outings, as are visits to neighboring islands. In June 1900 a large swing was erected on the northeast side of the dwelling.<sup>126</sup> Photographs show a heroic structure, with a seat wide enough for two (Figure 25). In 1919 the swing was replaced with an even larger structure, which appears to have been perhaps thirty feet tall, in approximately the same location<sup>127</sup> (Figure 26). By 1904, island residents and visitors could also play croquet on a new croquet ground constructed northeast of the lighthouse building.<sup>128</sup> Journal entries include frequent mention of visits to the sand point. That the sand spit served as not only a key component of the island's circulation system, but also as a recreation site, is further suggested by occasional references to tourists picnicking at the point. Visitor Evelyn Durocher's clear memory of beach characteristics in the 1920s corroborates this conclusion: "the beach [sand spit] was not nearly as large as it is now. At each end there were trees growing out almost to the water's edge. It was protected and private."<sup>129</sup>



Figure 25. Playing on the swing, ca. 1904. View to east. Note the assistant keepers' privy and shed #2 to the rear; the old woodshed behind shed #2; and the plank walkways (Lakeshore archives).

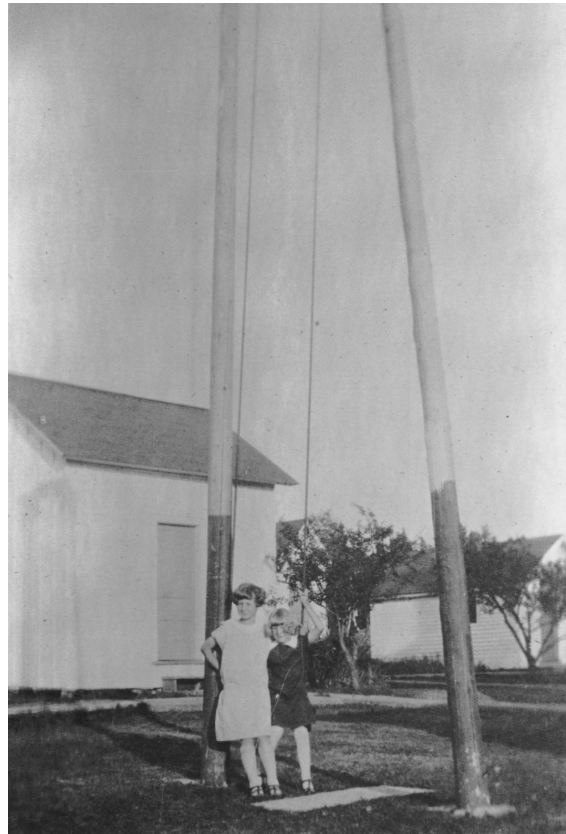


Figure 26. View of swing, ca. 1924. Note the apparent height of the swing; the woodshed, keeper's privy, and "shack" to the rear; and the concrete walkways (Lakeshore archives).

<sup>126</sup> Ibid., June 26, 1900,

<sup>127</sup> Ibid., July 31, 1919, August 1, 1919, August 2, 1919.

<sup>128</sup> Ibid., September 22, 1904, September 27, 1904, November 22, 1904.

<sup>129</sup> Ibid., passim, 1919, 1922, 1923, 1927; Evelyn (Lutz) Durocher, interview with Kate Lidfors, Aug. 19, 1980, Vertical Files: keeper/people folder, Lakeshore Library.

The station's flower gardens appear to have flourished in the 1920s, during the tenure of Keeper Lee Benton and his wife Anna. In her 1980 interview, Durocher specifically describes these beds as “built long and built up six to eight inches” and outlined with beach cobbles, “painted white, about the size of a soccer ball, some a little larger”<sup>130</sup> (Figures 27 and 28). Photographs from the 1920s, however, clearly indicate that the white-painted cobbles were considerably smaller than soccer balls, perhaps about the size of grapefruit. Growing in the gardens were peonies, dahlias, nasturtiums, pinks, zinnias, petunias, and pansies.<sup>131</sup> “Raspberry Island had the nicest gardens,” Durocher remembered. “Michigan [Island’s gardens] were nice too, but not as elaborate.”<sup>132</sup>



Figure 27. Flower gardens. View to north, ca. 1922. Note painted stone borders and foundation plantings against the lighthouse (Lakeshore archives).

---

<sup>130</sup> Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 16; Durocher interview, Aug. 19, 1980. Durocher and interviewer Kate Lidfors discussed a photograph showing a brick flower-garden border (“Now this looks as those were bricks on end”) yet Durocher established that “every other place they were white stone.” Durocher interview, 11.

<sup>131</sup> Jacker Diary, June 22, 1887; Durocher interview, *passim*; Handwritten notes, N. F. Parker, Vertical Files, Lakeshore Library.

<sup>132</sup> Durocher interview, 3. The efforts of these long-ago gardeners remain evident not only in the lawn and the reconstructed light station gardens, but also in the “escapee” exotic plants reported by park service naturalists. These include daisy-like flowers along the cliff by the dock and bamboo behind the lighthouse. Vicki Black, Karen Lindquist, and Lori Heinsohn, “A Naturalist’s Guide to the Raspberry Island Sandspit Trail,” (Apostle Islands National Lakeshore, 1981), n.p. Manuscript on file at DSC TIC.



Figure 28. View to north of flower gardens at southwest corner of lighthouse, ca. 1920. Compare with Figure 22. Foundation bed border appears to be brick placed on end. Plantings appear to include astilbe, nasturtium, and dahlias (Lakeshore archives).

A variety of other minor site improvements and/or modifications took place during this period. The first mention of a flagstaff at the station is found in a log entry from 1903, which records the loss of the flagstaff in a gale.<sup>133</sup> It is likely that a flagstaff had existed at the station for many years, though photographs taken before the construction of the fog signal building do not appear to show a flagstaff. A 1906 photograph (see Figure 21) shows a simple wood flagstaff located west of the lighthouse near the edge of the bluff. This pole appears to have blown down in 1913, and the keepers replaced it with a much more elaborate flagstaff that included a topmast and a gaff (see Figure 24). The pole was replaced on several subsequent occasions.<sup>134</sup> A 1930s photograph clearly shows a flag flying from a second pole located east of the fog signal building. This flagstaff appears to be in the location of the supports located near the existing vegetable garden (Figure 29).

---

<sup>133</sup> Keeper's Log abstracts, October 3, 1903.

<sup>134</sup> *Ibid.*, passim.



Figure 29. View from lake, ca. 1936. Note flagstaff to rear (east) of fog signal building (Lakeshore archives).

In 1909-1910 the four-rail yard fence was replaced by a wire fence with white-washed cedar posts (see Figures 22 and 23). The keepers cut and hauled the posts from the woods on the island.<sup>135</sup> The area enclosed by the fence was changed in 1930, when the Keeper's log notes that the old fence posts were pulled from the ground and the fence moved – whether to enclose a larger or smaller area is not known.<sup>136</sup>

In 1926 the installation of a radio at the station required construction of an aerial wire. A fifteen-foot cedar pole was attached to the barn, and the aerial wire stretched from the barn to a chimney on the lighthouse.<sup>137</sup> Other small-scale features that can be documented for this period include a clothesline, located east of the outbuildings.<sup>138</sup> It appears that in 1931 a wood walkway ran the

---

<sup>135</sup> Ibid., September 21, 1909, September 22, 1909, April 21, 1910, April 22, 1910, June 13, 1910.

<sup>136</sup> Ibid., June 21, 23, 25, 28 1930, July 23, 1930.

<sup>137</sup> Ibid., August 9, 1926, August 30, 1926.

<sup>138</sup> Ibid., May 6, 1921.

length of the clothesline. This walkway was removed in 1939.<sup>139</sup> It appears likely that the present clothesline posts date from ca. 1939.

The fog signal building was significantly altered on two occasions after its construction. In 1925 it was determined that the drain beneath the building, used to dispose of water used to wash the floors, had broken and was allowing water to seep under and weaken the building's foundation. Repairs entailed removing the floor, replacing the drain line, and applying a steel I-beam to the west façade of the building to provide increased structural stability<sup>140</sup> (Figure 30).

A number of other drain lines, generally referred to as "sewers" in the Keeper's logs, existed on the site. The first reference in the logs is an entry from 1900 that notes the landing of sewer pipe at the station. This sewer was completed in 1901. Its location is unspecified, but log entries noting the repair of the sewer indicate that it provided drainage from the lighthouse to the edge of the bluff.<sup>141</sup>



Figure 30. Hauling equipment for refitting of fog signal, ca. 1932. Note I-beam on front (west) façade of building, added in 1925 (Lakeshore archives).

In 1932 the steam-powered fog signal whistle was replaced with an air diaphone system. Run by "semi-diesel engines" and air compressors, the new air diaphones represent an innovation introduced throughout the federal lighthouse system. Keepers and assistant keepers were thereafter spared the time-consuming chores of shoveling coal and maintaining steam boilers and faced instead the more complicated task of diesel engine maintenance. Related infrastructure changes included removal of the fog signal building's interior wall, which had divided the coal- and wood-storage area from the machine room and conversion of the area to work space. A large gable-roofed dormer that provided the height required by the air diaphone apparatus was added to the west facade (see Figure 29). The horns extended through the windows in the dormer. Two diesel fuel storage tanks, consisting of metal tanks resting on concrete "saddles," were constructed adjacent to the southeast corner of the building, flanking the oil building to the north and south<sup>142</sup> (Figure 31).

---

<sup>139</sup> Ibid., July 6, 1931, September 4, 1931, August 25, 1939.

<sup>140</sup> Ibid., July 9, 1925, November 7, 1925.

<sup>141</sup> Ibid., August 23, 1900, July 15, 1901, August 20, 1909, October 28, 1912, August 20, 1931.

<sup>142</sup> Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 105-108.



Concurrent with the modifications to the fog-signal building were repairs to the boathouse and construction of a new dock, concrete stairway, and tramway at the station dock. The wood tramway was reported to be in a "state of condition almost beyond use, and [the] present dock and boat house need repairs to preserve them from destruction by seas."<sup>143</sup> *The Bayfield Press* reported that the new dock and

tramway were patterned after those built at Michigan Island three years earlier, consistent with the Lighthouse Service's use of standard plans.<sup>144</sup> These modifications altered at least one long-standing land use practice. The new diesel engines in the fog-signal building eliminated the need for wood as back-up fuel, and wood harvest on the island appears to have substantially diminished as a result. After 1932 there are only occasional references to wood cutting in the Keepers' logs and those references all point to stove rather than signal fuel.

From 1932 through 1938, Raspberry Island Light Station continued to be manned by civilian employees of the Lighthouse Service. Alterations to the site were minimal (Figure 32). Alterations associated with the operation of the station included the construction of wooden range markers, located south of the fenced yard, but within the station clearing, that can be seen in photos from the mid-1930s. These simple structures, made with painted poles and boards, helped navigators determine whether or not they were in the shipping channel (Figure 33). In 1932 a chimney foundation (extant) was constructed adjacent to the east façade of shed #1. This building, which had served various functions over time, was then being used as a wash house/laundry.<sup>145</sup>

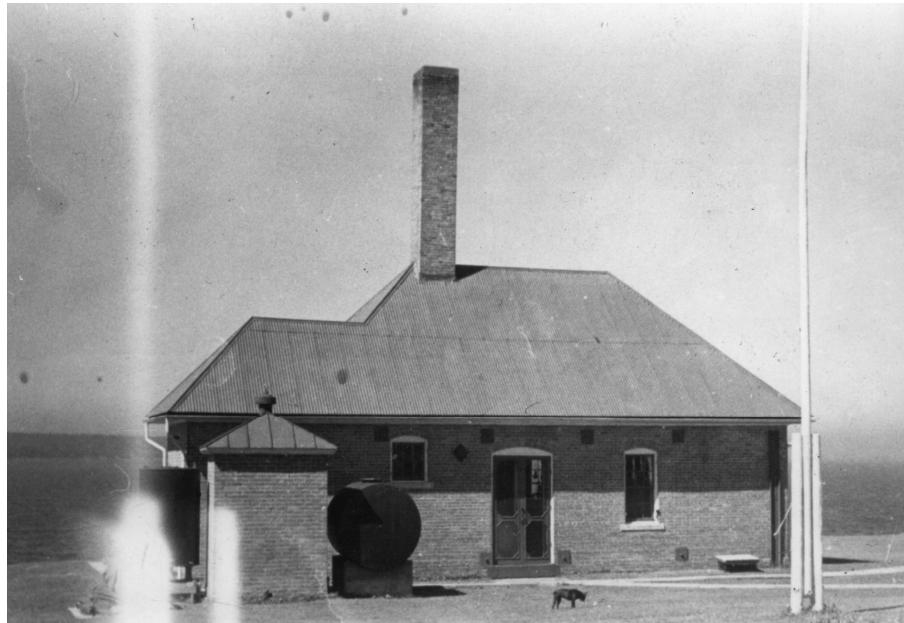


Figure 31. View to west of fog signal building, ca. 1945. Note fuel oil tanks flanking oil building; and flagstaff/aerial mast (Lakeshore archives).

---

<sup>143</sup> Ibid., p. 108.

<sup>144</sup> Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 12; Keeper's Log abstracts, passim November 1932.

<sup>145</sup> Ibid., August 17, 1932.



INSERT 11x17 MAP

Figure 32. Raspberry Island Historic Base Map: 1901-1947.





Figure 33. View from lake, ca. 1936. Note flagstaff with topmast, and range marker at right (Lakeshore archives).

Alterations related to the life of the keepers and their families included the enclosure of the front (west) porches of the lighthouse with screening in 1931<sup>146</sup> (Figure 34). In 1935, keepers built a bridge across one of the ravines on the trail to the sand point<sup>147</sup>, and also added a "root house," in the "woods back of dwelling."<sup>148</sup>

Birdhouses were erected in 1931, and are visible, outside the yard fence, in photographs from the early 1940s.<sup>149</sup> A cobble stone birdbath was constructed just south of the flagstaff in front of the lighthouse in the mid-1930s (Figure 35).



Figure 34. View to northeast of lighthouse, ca. 1936. Note screened porches and mountain ash directly west of light tower (Lakeshore archives).

<sup>146</sup> Ibid., October 10, 1931.

<sup>147</sup> Ibid., November 25 and 26, 1935.

<sup>148</sup> Ibid., November 29 through December 2, 1935. The remains of a root house were located in December of 2002.

<sup>149</sup> Ibid., May 6, 1931.



Figure 35. View to southeast of family group, ca. 1936. Note birdbath; wire yard fence at rear; range markers behind yard fence between barn and fog signal building and at extreme right. The open area between the buildings may be the vegetable garden (Lakeshore archives).

Gardens and landscaping continued to reflect the personal preference of the keepers. In 1935 a flower garden was created on the east side of shed #1.<sup>150</sup> In 1938 considerable effort was put into creating a new series of gardens west of the lighthouse building and on the bluff itself. Cedars and mountain ash were planted in front (west) of the dwelling, and an elaborate flowerbed, with rock walls and cedar poles used to retain soil, was constructed on the side hill of the bluff below the fog signal building. Photographs indicate that this garden included painted stones that spelled "Raspberry Island"<sup>151</sup> (Figures 36 and 37). Over the years, various keepers planted rosebushes and bulbs, and cut sod to plant on the side hill below the station. Presumably, the chore of brushing the clearing continued to occupy the keepers' time, since the light station clearing was maintained through this period.

---

<sup>150</sup> Ibid., September 18, 1935.

<sup>151</sup> Ibid., passim 1938 and 1939.

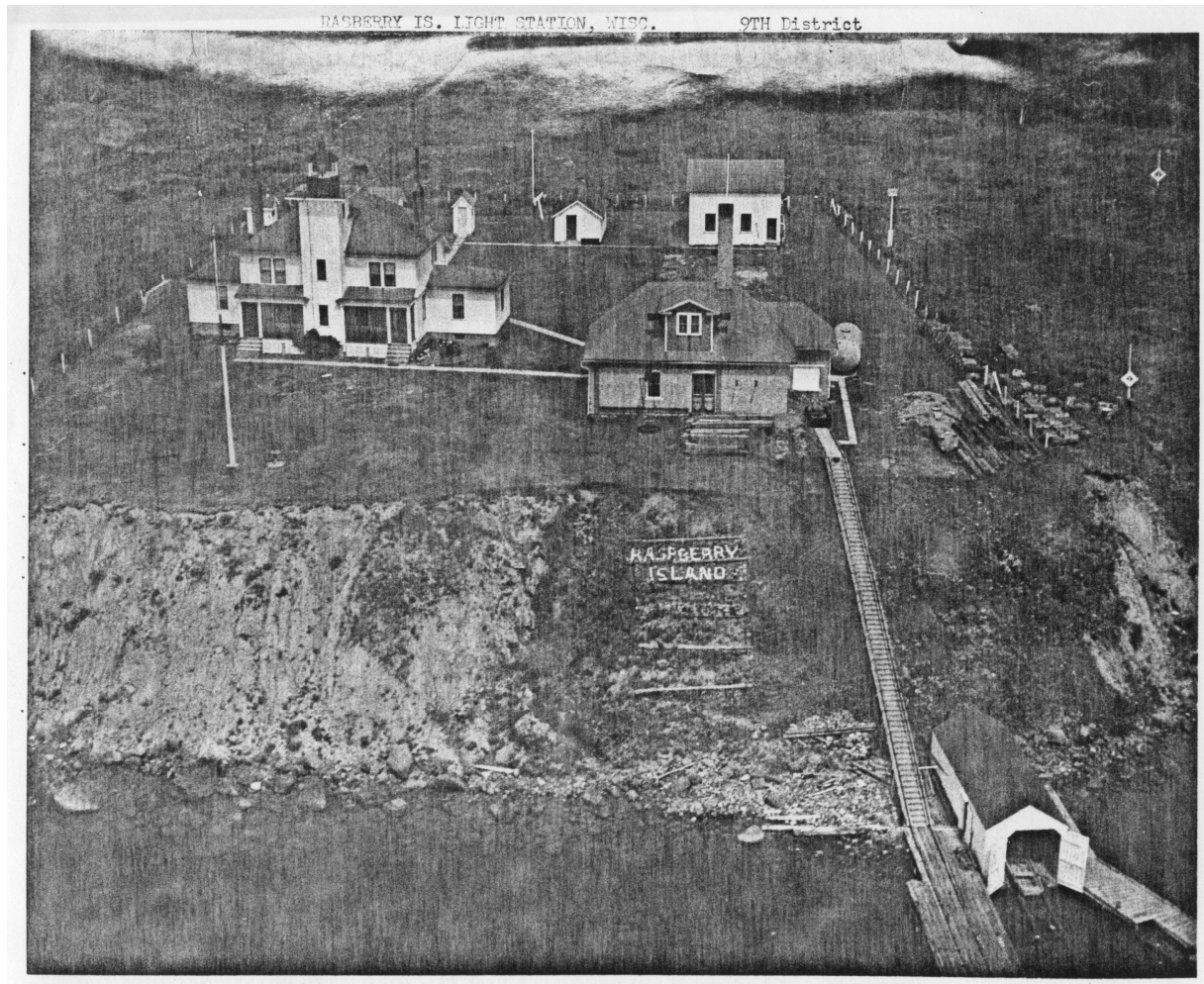


Figure 36. Aerial view to east of the station, ca. 1940. Note the extent of the clearing; wire yard fence; flagstaff with topmast; birdbath to south of flagstaff; clothesline behind outbuildings; birdhouse to south of barn; range markers at far right; flower garden and station name on bluff below fog signal building; fuel oil tank at southeast corner of fog signal building; and equipment and material at southwest corner of yard (Lakeshore archives).





Figure 37. Aerial view to north of the station, ca. 1940. Compare with Figure 36. Note garden patch in front (west) of barn; and flagstaff or aerial mast, with supports, west of garden plot (Lakeshore archives).

## Coast Guard Manning and Operation of Raspberry Island Light Station: 1939-1947

In 1939, Congress assigned responsibility for the Lighthouse Service to the United States Coast Guard, ending the period of civilian operation and introducing a military hierarchy and standards of operation. Keepers previously employed by the Lighthouse Service had the option of retaining their civilian status, or becoming regular Coast Guardsmen. Because Raspberry Island's keepers' journals end in 1939, there is little surviving documentation regarding the last eight years the station was staffed.<sup>152</sup>

The Coast Guard discouraged keepers from bringing their families to reside on the island. Families were sometimes present, however, as indicated by a 1942 photograph of Keeper Alva Carpenter picnicking in the lighthouse yard with his wife, children, and other friends (Figure 38). Certainly, the elaborate flowerbeds developed in the 1920s during the Benton's tenure, were

---

<sup>152</sup> Rathbun, "Special History Study: Light Stations of the Apostle Islands National Lakeshore," p. 16; Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 124.

largely absent by the 1940s, replaced by the previously described hillside garden that included an identifying sign constructed of white painted stones, below the fog signal building (see Figures 36 and 37). At least some of the keepers continued the tradition of growing a vegetable garden (Figure 39).



Figure 38. Keeper Alva Carpenter picnicking in the lighthouse yard with family and friends, ca. 1942. Note picnic table and reel for fishing net (Lakeshore archives).



Figure 39. Keeper Alva Carpenter's garden, ca. 1944. View to north. Note L-shaped plan of plot and north-south orientation of furrows. Also note, in background, swing; wire yard fence; and birdhouse (Lakeshore archives).

Although the Coast Guard made few changes to the buildings on Raspberry Island, it continued to update the station's equipment. The principal change at the station resulted from the 1941 conversion of the light and fog signal to electricity. This conversion significantly reduced the duties and responsibilities of the keepers. Diesel generators located in the fog signal building generated electricity that was stored in banks of storage batteries. Other changes introduced during this period included the installation, between 1940 and 1941, of a radiophone that permitted voice communication between the island and other lighthouses and Coast Guard facilities. The radiophone transmitter was powered by a surplus Kohler generating plant (100 volt, 1 1/2 KW), which charged the 6-volt batteries that operated the receiver. To receive and send signals, a 45-foot-high antenna was needed, consisting of a wooden "mast" with a wire running to the top. The project was completed in 1941.<sup>153</sup>

In 1946 and 1947, in accordance with nationwide trends, the Coast Guard replaced the air diaphone system with an automatic CO2 bell striker and replaced the flash panels in the lantern room with a battery-operated electronic flashing unit. Both steps prepared the site for automation of the facility at the end of the 1947 season. In May 1948, for the first time in 85 summers, the station stood uninhabited. In his book *Great American Lighthouses* Ross Holland wrote:

Advanced technology has reduced a light station that once had a double keeper's dwelling with attached tower, an oil house, storage and workshop structures and privies to a solar-powered light on a post that occupies a piece of land two feet square. Two keepers maintained the old light station and kept the light burning. The modern day tower at Raspberry Island requires attention just once a year.<sup>154</sup>

## Abandonment and Rehabilitation: 1948-1974

Between 1948 and 1958 the buildings at Raspberry Island stood largely uninhabited. The new battery operated light projected from the lighthouse tower without the need for maintenance and attention from resident keepers. In 1957, the Coast Guard removed the Fresnel lens from the lighthouse and donated it to the Madeline Island Historical Museum. The light was replaced with a 160-candlepower light mounted atop a pole located at the bluff's edge in front of the fog signal building. This light was visible to passing ships for a distance of seven miles<sup>155</sup> (Figure 40).

With all "official" functions removed from the lighthouse, the Coast Guard was free to find a new use for the site. In 1958 it leased the light station buildings to Ellerbee Architects of Minneapolis, Minnesota, for use as a corporate retreat. Employees and clients of the firm fished, picnicked, swam, and enjoyed the island's solitude. The average number of guests at any given time was twenty. The guests stayed in one of three apartments, all located in the lighthouse building. Apartment A, the largest, comprised the original keeper's apartment on the south side of the building. Apartment B, was the first assistant keeper's quarters on the first floor of the

---

<sup>153</sup> Ibid., 124-127. The location of the aerial mast has not been identified. It is possible that the 1926 mast atop the barn was reused. It is also possible that the second flagstaff visible east of the fog signal building in a 1930s photograph served as the aerial mast.

<sup>154</sup> Quoted in Ibid., 135.

<sup>155</sup> Ibid.



north half of the building. Apartment C, comprised the second assistant keeper's quarters on the second floor of the north half.<sup>156</sup>

Ellerbe Architects hired Bayfield residents as on-site caretakers at Raspberry Island. Caretaker Mel Erickson, who served in that position from 1962 to 1974, converted the 1½-story barn to residential use in 1963. Shed #1 appears to have been converted for use as residential space during this period. All of the living quarters utilized by Ellerbe Architects and their caretakers were modified by the addition of non-historic finish materials, including linoleum, wall paneling, and ceiling tiles. Other than the alterations to the interior of the lighthouse, barn, and shed #1, the other buildings on the site appear to have remained largely unaltered during this period. It is presumed that the lessees continued to use the station's existing sanitary and water facilities.

Sometime prior to 1975 the Bureau of Land Management (BLM) took possession of the island from the Coast Guard. It appears that the BLM continued the lease agreement with Ellerbe Architects initiated by the Coast Guard. In 1975 the National Park Service assumed control of Raspberry Island, as part of the Apostle Islands National Lakeshore.<sup>157</sup> The Coast Guard, however, retained the right to maintain and operate the navigation beacon.



Figure 40. U.S. Coast Guard Navigation beacon, view to north, ca. 2000.

Although Ellerbe Architects made some minor changes to the historic fabric of several of the station buildings during their tenure, the biggest change to the light station during this period resulted from the lack of maintenance within the historical light station clearing. Since at least 1957, when the Coast Guard established the new electric beacon in front of the fog signal building, native vegetation has been allowed to regenerate within the station clearing.<sup>158</sup> This has significantly reduced the apparent size of the station clearing (Figure 41). The lighthouse yard, the area enclosed by a fence during the majority of the historic period, remains relatively clearly defined, though the fence was removed at an unknown date. The larger clearing is less readily visible, as a result of new vegetation reclaiming this historically cleared area (Figure 42).

---

<sup>156</sup> Ibid., 140.

<sup>157</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 42.

<sup>158</sup> Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*.



Figure 41. View to east from lake, ca. 1970s. Note encroachment of vegetation into station clearing and erosion of bluff. Compare to Figure 7 (Lakeshore archives).

## **National Park Service Management: 1975-2003**

Apostle Islands National Lakeshore, a component of the National Park System, was established in 1970. It initially included twenty of the twenty-two Apostle Islands, excluding Madeline and Long Islands, and a segment of the mainland lakeshore. The National Park Service acquired all of the archipelago's light stations and their accompanying land reservations except for Sand Island, transferred earlier by the Coast Guard to the United States Forest Service, and Raspberry Island, transferred earlier to the Bureau of Land Management.

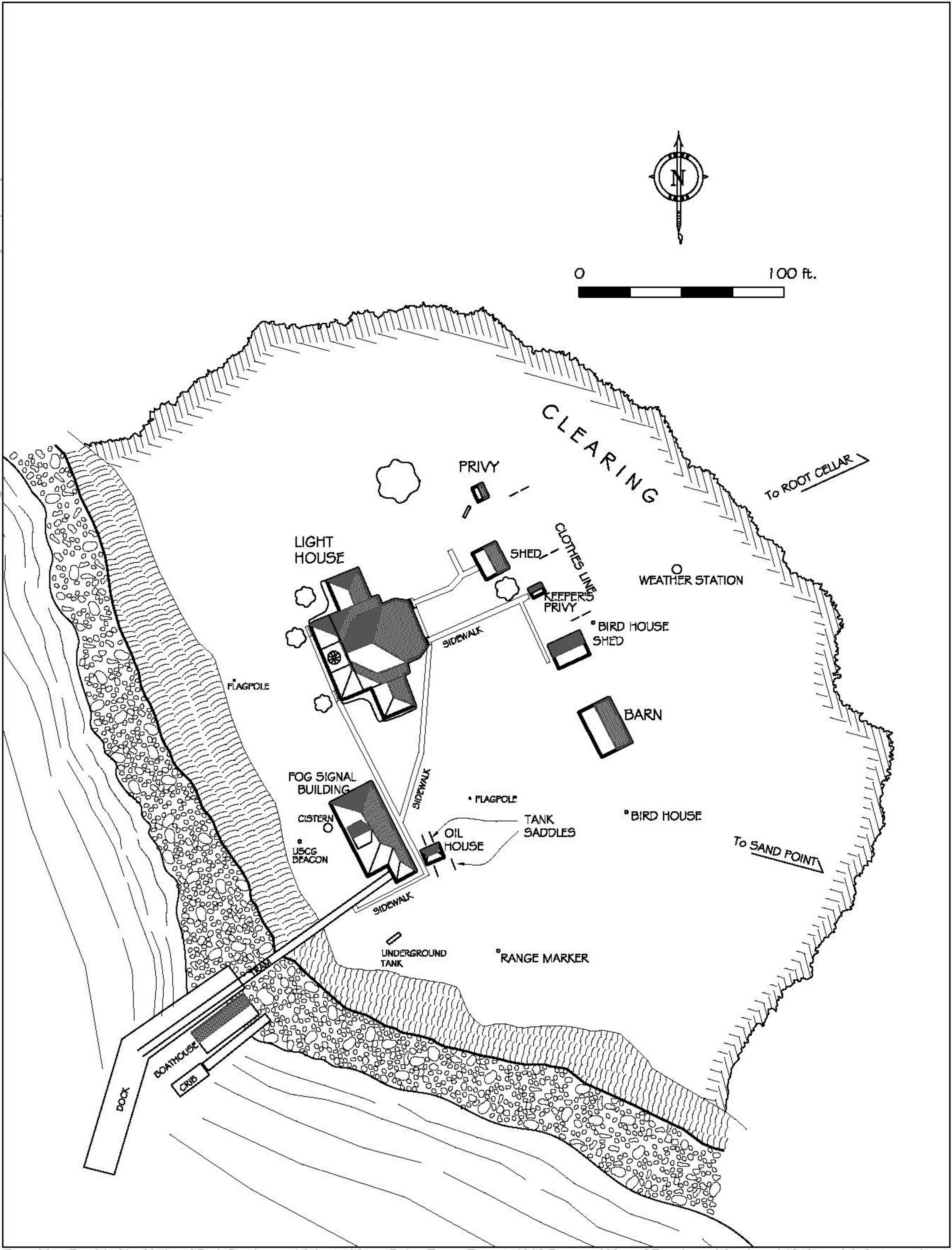
Former Lakeshore historian David Snyder writes that one of the earliest references in the park files to Raspberry Island is in a 1974 letter from Chief Ranger Douglas Barnard, Apostle Islands National Lakeshore, to the Lands Office, of the Midwest Region of the National Park Service. In his letter, Barnard expressed concern about the permit holders (presumably Ellerbee Architects) who were altering and repairing a historic structure. Subsequently, in 1975, the Apostle Islands superintendent wrote to the National Park Service's Midwest regional director to express frustration with the delay in the transfer of Raspberry Island:

We still have significant lands, on which are located historic structures, being held by the Bureau of Land Management. The National Park Service made transfer requests in February. The only information we have received on this progress is through Associate Director Dean's efforts (which we requested) and a resulting telephone call from Deputy Regional Director Giles explaining Bureau of Land Management's desire to meet and talk. If the Lands Division does not have time to pursue the transfer progress, we believe

INSERT 11x17 MAP

Figure 42. Raspberry Island Historic Base Map: 1948-1974.





we are capable of negotiating with the Bureau of Land Management's Regional Office for the transfer, if you wish.<sup>159</sup>

The National Park Service took possession of Raspberry Island in late 1975. A building inspection form from that year states that the lighthouse had been roofed with asbestos shingles. However, there is no physical evidence, such as holes from fasteners or remnants of adhesive on the historic metal shingles to suggest that this non-historic roofing material ever existed.<sup>160</sup>

Lakeshore staff and professional historical architects from the Midwest Regional Office began to stabilize the Raspberry Island buildings in 1977 (Figure 43). Efforts were devoted principally to the lighthouse, and included construction of a concrete block retaining wall along the entire east foundation wall of the lighthouse, application of masonry waterproofing, installation of site drainage lines, painting to historic specifications, and improvements associated with health and safety requirements. Site work also appears to have included construction of a drainage ditch along the east side of the lighthouse yard – apparently an attempt to divert water draining from the slope east of the buildings. In 1982 the park service undertook significant window repairs. This work appears to have entailed stripping, refinishing, and reglazing of historic sash and selected replacement of damaged sash. In 1987 the steps and porches of the two east (rear) entries were rebuilt and are "virtually identical to their historic counterparts."<sup>161</sup>



Figure 43. Boathouse and dock. View to east, 1977 (Lakeshore archives).

---

<sup>159</sup> Quoted in Snyder, *Historic Structure Report – Historical Data Section, Raspberry Island Lighthouse*, 143.

<sup>160</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse*, 43.

<sup>161</sup> Ibid.

In 1981, a concessionaire initiated boat tours of the Apostle Islands that included visits to the light stations. Due partially to the suitability of its dock, which can accommodate larger boats, the concessionaire's tour included a stop and disembarkation at Raspberry Island. In addition to these commercial tours, private boat owners touring the islands also visited Raspberry Island, typically landing at the sand point to camp, or hike the three-quarter-mile trail to the station clearing. To accommodate this increased level of visitor use, the park service added two pit toilets at the south end of the historic clearing and installed interpretive and informational signboards (Figure 44). The park hired a seasonal interpretive ranger to conduct guided tours of the lighthouse.<sup>162</sup>



Figure 44. National Park Service interpretive signs. View to northwest, 2003.

In 1982, the Lakeshore historian, Kate Lidfors, prepared a restoration plan for Raspberry Island's ornamental flowerbeds. The intent of the plan was to provide the documentation required to restore the ornamental vegetation to a ca. 1920 appearance. Lidfors conducted oral history interviews and used historical photographs to reconstruct the composition of the various flowerbeds. Lakeshore personnel accomplished the initial reconstruction by volunteering their time<sup>163</sup> (Figures 45 and 46).

---

<sup>162</sup> During the 1980s and 1990s, the ranger resided on site in the barn/warehouse, as did park service maintenance personnel responsible for grounds, building, and trail maintenance.

<sup>163</sup> Currently, a local 4-H Club plants and tends the gardens.





Figure 45. Reconstructed flowerbed. View to south, ca. 1984 (Lakeshore archives).



Figure 46. Reconstructed vegetable garden. View to southeast, 1984. Note potato patch south of barn (Lakeshore archives).

Also in 1982, the lakeshore upgraded the island's water system. From a new intake pipe a pump in the boathouse raised water to a 200-gallon fiberglass storage tank located behind the barn (Figure 47). The main, copper distribution line was replaced with PVC pipe, and a new distribution line brought water to the barn. The old distribution line to the lighthouse was tied to the new main line.<sup>164</sup>

In 1989, David H. Wallace from the National Park Service Harpers Ferry Center, completed a Historic Furnishings Report for the lighthouse, which included a plan for furnishing the keeper's quarters in the south half of the building according to its appearance during Keeper Lee Benton's tenure (1914 to 1924) using personal items donated to the lakeshore by Benton's heirs.<sup>165</sup>

In 1994, Lakeshore historian David Snyder completed the historical data section for a Historic Structure Report (HSR) for the Raspberry Island Lighthouse, which was followed in 2000 by the complete HSR prepared by Quinn Evans Architects of Ann Arbor, Michigan. The recommendations contained within the HSR include a variety of options for rehabilitating the interior of the lighthouse to accommodate a museum in the south half of the building and apartments in the north half for seasonal lakeshore personnel. The HSR also recommends upgrading site utilities (septic, water and electrical systems) to accommodate the residential use within the lighthouse.

Another recent planning study that has the potential to influence the manner in which the Raspberry Island light station is managed is the wilderness suitability study initiated in 2000. As



Figure 47. Construction of water tank, ca. 1982 (Lakeshore archives).

---

<sup>164</sup> Drawing No. 633-80022, "As Constructed, Raspberry Island Water System," 1982. Copy available at NPS TIC.

<sup>165</sup> David H. Wallace, *Historic Furnishings Report Raspberry Island Light Station*, 1989. Report prepared for Apostle Islands National Lakeshore.



a result of this study, in 2004 the National Park Service released a Wilderness Study and Environmental Impact Statement (EIS) for Apostle Islands National Lakeshore. The preferred alternative recommends that roughly 80 percent of the park's land base be designated as wilderness. At Raspberry Island and the other light stations, it is recommended that the historical clearings be excluded from wilderness designation.

Most recently, the lakeshore has undertaken a major bank stabilization project below the light station buildings. Erosion of the clay bank in front of the building had been an ongoing problem for years – the "loose stone shore protection" located at the base of the bank during the majority of the historical period proved insufficient to prevent erosion and slumping at the edge of the cut bank in front of the lighthouse complex (Figures 48 and 49). The edge of the bluff is presently as much as twenty to forty feet closer to the fog signal building and lighthouse than during the first quarter of the twentieth century. The solution selected by the lakeshore entailed placement of a rubble mound revetment along roughly 200 feet of bank below the buildings. The revetment consists of a band of "armor" stone (boulder-sized rock) that extends roughly 25 feet into the water, with smaller filter stone extending from the armor stone to the top of the bank. The filter stone is covered with soil and will eventually support native vegetation (Figures 50 and 51).

Over fifty years after the automation of the Raspberry Island light the buildings at the station retain their historical integrity. These buildings form the focal point of the light station, and, although all require some level of stabilization and maintenance effort, they possess integrity of materials, workmanship and design relative to the second period of development.

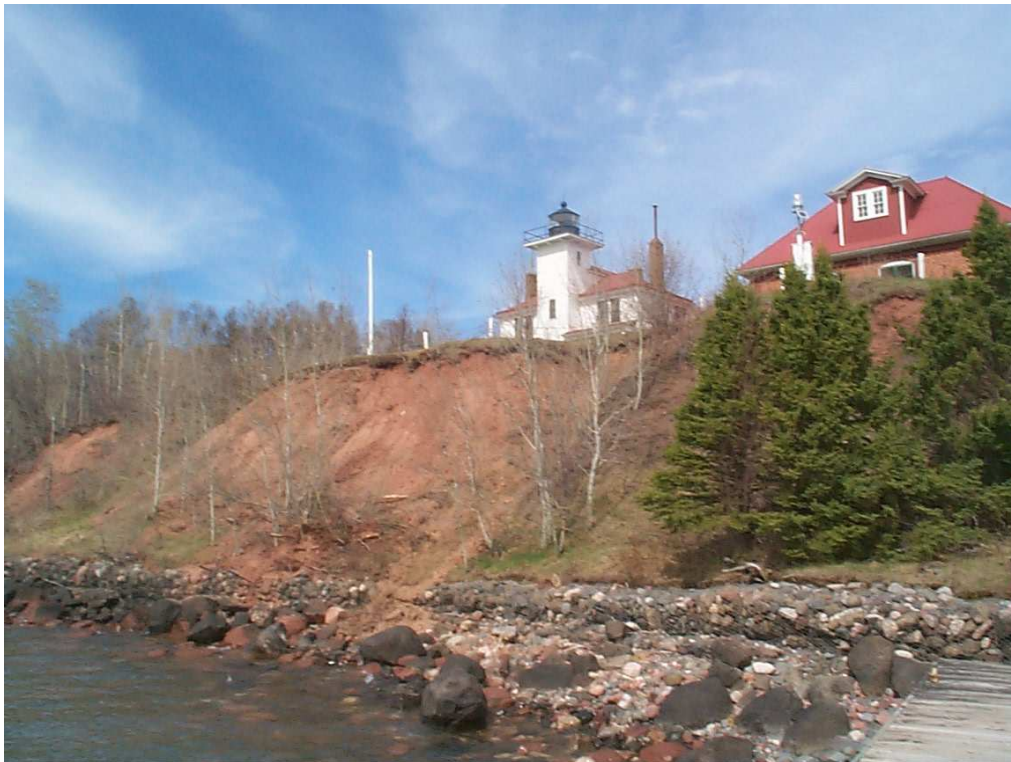


Figure 48. View to northeast of bank erosion, May 2001(Lakeshore archives).



Figure 49. Bank erosion detail. View to north, May 2001(Lakeshore archives).



Figure 50. Revetment construction. End of first construction season, 2002.





Figure 51. Top of slope at end of first construction season. View to northwest, 2002.  
Note U.S. Coast Guard beacon and fog signal cistern.

Other aspects of the cultural landscape have not fared so well. The light station clearing, established in 1862, has not been maintained since at least 1957 (see Figure 37). As a result, the secondary forest canopy now encroaches on the station clearing. Pioneer species such as red osier dogwood are establishing themselves at the margin of the lighthouse yard, formerly defined by a fence, and, if not controlled, will overcome some of the ornamental plantings at the yard's perimeter. The regeneration of the forest within the clearing adversely affects the integrity of the historic site, by making it more difficult to understand the importance of the historic lighthouse placement and function. In addition, the accumulation of forest fuels in proximity to the wooden lighthouse buildings poses a fire threat that should be mitigated. Besides the natural processes that threaten the Raspberry Island cultural landscape, proposed alterations to the site associated with the rehabilitation of the lighthouse have the potential to introduce new, noncontributing elements to the historical scene. New maintenance and preservation efforts will be required in order to stabilize Raspberry Island's contributing cultural landscape features.



## Chapter 3: Existing Conditions

This chapter describes the contemporary Raspberry Island Station landscape. Based upon archival research and field survey, it documents various landscape characteristics such as circulation systems, vegetation, structures, and land use that together comprise the island's cultural landscape (Figure 52).

### Natural Systems and Features

Raspberry Island's location proximate to important shipping lanes led to establishment of a light station on the island. The physical conditions that led the federal government to select Raspberry Island as a location for a navigational aid have not changed in the nearly 150 years that have elapsed since that decision.

Raspberry Island is located towards the southeast end of the Apostle Island Archipelago, roughly two miles from the Bayfield Peninsula mainland. The navigation route historically known as the West Channel lies west of the island in Raspberry Bay. The open waters of Lake Superior and the lake's main east-west navigation lanes lie roughly eight miles to the northwest.

The climate of the region is characterized by cold, snowy winters and warm, moist summers. Within the archipelago, and on the peninsula, the proximity of Lake Superior moderates temperatures, creating cooler summers and warmer winters than inland. The ice-free navigation season usually extends from April to November, although the actual dates depend entirely upon the formation and breakup of ice on the lake. Although somewhat protected by surrounding islands (Oak, Bear and York Islands), Raspberry Island is subject to violent storms and the resulting wave action is a major natural force that continuously sculpts local landforms through erosion and subsequent deposition of eroded materials.

The geology and soils of Raspberry Island are typical of the 22 islands in the archipelago, consisting of Precambrian sandstone cliffs, clay banks, and sand beaches exposed in various areas of the shoreline. Steep clay banks predominate on Raspberry Island and, like the sandstone cliffs that outcrop just north of the lighthouse and along the island's northeast coast, are difficult to access from the water. The sand spit on the southeast end of the island provides the easiest natural access, as it did during the historical period.

### Spatial Organization

Historically the Raspberry Island Lighthouse Station was organized into three primary landscape areas: the main building cluster defined by a fence and generally known as the lighthouse yard, the larger station clearing that surrounded the yard, and the native forest that comprised the remainder of the island. The lighthouse yard was the heart of the site and for the majority of the site's history included nearly all of the station's buildings and structures. The clearing, created to provide the required arc for the light, was cultivated as hay fields at various points in the station's history. Any use of the clearing had to accommodate the need to provide a clear arc for the sweep of the light. The remainder of the island was largely left undeveloped. The forest provided timber for construction and firewood for island stoves and boilers. Island residents established

paths that led to woodlots and berry patches, as well as to the sand spit landing and the Sand Island overlook point.

The basic spatial organization of yard, clearing, and forest remains readily apparent and reflects historic patterns, though the boundaries between the three areas have become somewhat indistinct. The lighthouse yard continues to contain the vast majority of the island's buildings and structures, as well as associated paths, walkways, lawns, gardens, and other landscape elements. The fence that historically separated the yard from the clearing is no longer extant, somewhat blurring the boundary between the two areas.

The clearing has not been maintained as it was during manned operation of the light station since at least 1957 and is presently being encroached upon by second growth forest and invasives. The outer edge of the clearing, historically a clear demarcation with the surrounding forest, is not readily apparent to an untrained eye. The National Park Service has constructed some visitor facilities, including interpretive signs and pit toilets, within the historic boundaries of the clearing.

The forested portions of the island largely remain forested. The forest has encroached into the clearing, as noted above. The woods have also presumably become somewhat denser than they were during the period of manned operation with the cessation of limited harvesting of firewood and building timber by station personnel.

## **Land Use**

Although the Coast Guard continues to maintain a navigational aid on Raspberry Island, the complex system of land uses associated with the period of manned operation has been largely eliminated. The NPS currently uses the island for interpretive purposes, the focus of which is the historical building cluster located in the lighthouse yard. Ancillary uses include seasonal housing for the Lakeshore staff, located in the outbuildings behind (east) the lighthouse and fog signal building, and visitor services (pit toilets, picnic tables, and interpretive signs), placed within the yard and clearing.

The clearing is no longer maintained in either functional or aesthetic terms. Encroachment by the surrounding forest is reclaiming the clearing. The island's forest is largely used as a natural area, with the exception of the sand spit, where some pit toilets are available for visitors using the spit as a boat landing, and an improved trail that leads from the sand spit to the lighthouse yard.

## **Circulation**

The existing circulation patterns closely approximate those that existed during the period of manned operations at the light station. During the ice-free season, Raspberry Island is accessible only by boat. The main dock below the lighthouse is the most frequently used landing. Concession tour boats drop off as many as 80 people at a time for tours of the light station. National Park Service boats also use this dock to transfer people and supplies.

From the dock, visitors use the 1930s concrete stair/tramway to gain access to the lighthouse yard atop the bluff. Similarly, supplies are moved from the dock to the bluff top using the historical tramway and hoist. Atop the bluff, a series of concrete walks, all of which date to the

INSERT 11x17 MAP

Figure 52. Map of existing conditions.





historical period, link the majority of the buildings. Circulation through the lighthouse yard is not, however, limited to these paths, and visitors may move at will throughout the yard to view the buildings and grounds and to make use of picnic tables that are set about the lighthouse yard. The historic wood plank walkways and cinder paths are no longer extant, or survive only as fragmentary archaeological resources.

An alternative landing is available at the "sand spit" on the southeast end of the island, roughly three-quarters of a mile from the light station clearing (Figure 53). This landing is used by small privately owned watercraft during most weather conditions and by larger NPS vessels when conditions preclude landing at the main dock. Visitors landing on the island at the sand point walk to the light station clearing on a trail that passes through the woods



Figure 53. Sand spit. View to north, 2003.

along the south edge of the island. The existing trail appears to follow the route of a historical trail that connected the light station with the sand point, although some of the associated structures (water bars, corduroy and stairs) are modern.

A second trail extends north from the light station clearing for roughly one mile to the Sand Island overlook. This is a primitive, cleared path through the woods constructed by the NPS. The trail dead-ends at the point where NPS staff believes the Raspberry Island keepers made daily trips, beginning in the 1920s, to check on the operation of the automated Sand Island light (Figure 54).

Though none of the circulation elements are actively interpreted each element associated with the lighthouse yard (dock, stair, and walks) is introduced to the visitor in an experiential manner. Likewise, the two trails are for the visitor who has time and interest in further exploration of the island.

## Topography

The topography of Raspberry Island played a major role in the selection of the island as the site for a lighthouse. The level, elevated bluff that rises forty feet above the water's edge at the west end of the island – directly adjacent to the navigation channel, offered an ideal site for a lighthouse and the associated infrastructure needed to support the lighthouse keepers.

Historic maps from 1877 and 1910 indicate that the topography of the island has experienced little change since establishment of the station, with the exception of erosion of the bluff

immediately west of the lighthouse as a result of wave action. The highest point of the island is centrally located between the lighthouse yard and the sand point, well within the forest canopy. Within the station clearing the land slopes from east to west (from the historic edge of the clearing towards the bluff) at an approximate rate of 1:10.

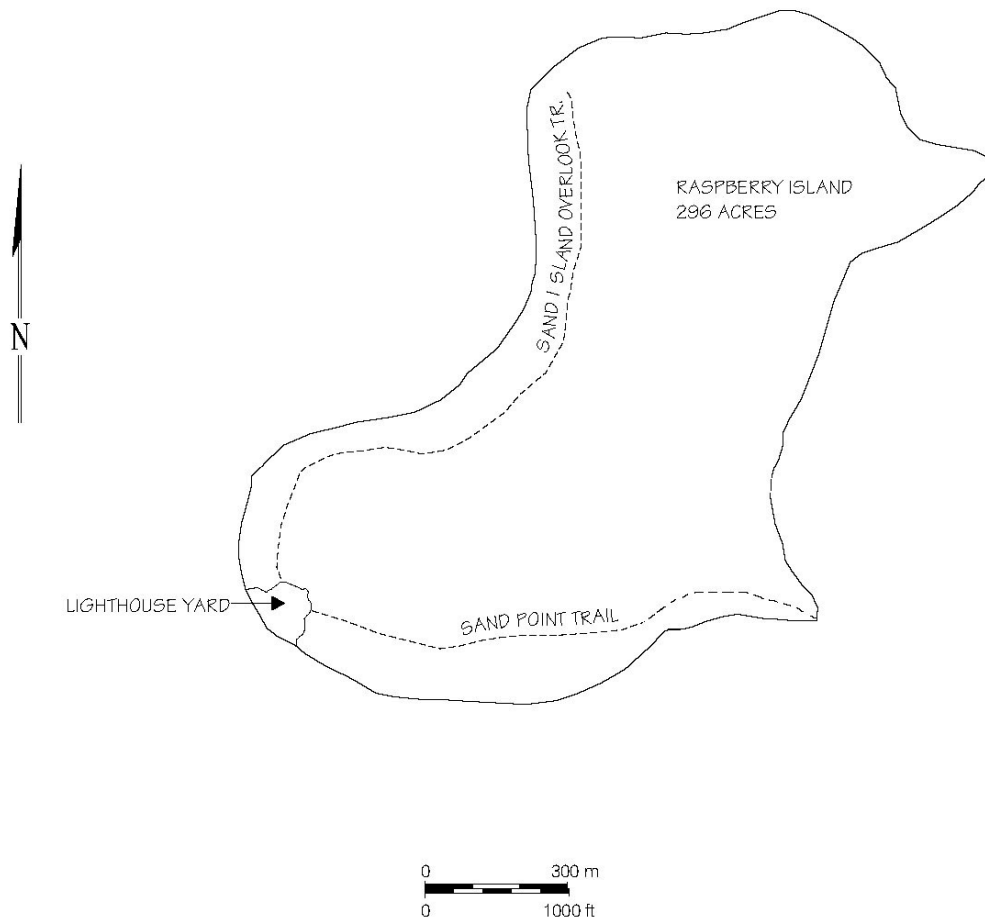


Figure 54. Approximate locations of existing trails.

Natural erosion and human efforts to stem this erosion have significantly altered the bluff. Erosion of the bluff has altered spatial relationships in the lighthouse yard by eliminating a strip of level ground between twenty and forty feet in width from the area immediately west of the lighthouse and fog signal building.

The existing condition of the bluff reflects a major stabilization project, completed in 2003, which added nearly forty feet of material to the base of the bluff. This engineered revetment consists of a French drain installed at the top of the bluff to aid drainage, stone riprap placed along the bottom third of the bluff, and replanted native species on the upper two-thirds of the

slope. This planting design is intended encourage revegetation of native species while protecting the bluff face and allowing the view from the top of the bluff to the west to remain unimpaired.

The other principal topographic feature at the site is a small ditch, created by the NPS, dug around the perimeter of the lighthouse yard. This ditch aids in the drainage of the heavy clay soil. It is visually hidden by unmown grass.

## **Buildings and Structures**

All the buildings and structures associated with the Raspberry Island Light Station are located in a single cluster within the light station clearing at the southwest end of the island. The dates of construction of these resources range from 1862 (original portions of the lighthouse) to the 1940s. Previous preservation and planning efforts have focused on the lighthouse, which forms the focal point of the building cluster. The Lakeshore personnel conduct routine maintenance at the buildings. Several of the ancillary buildings are in need of stabilization to arrest ongoing deterioration.

### **Raspberry Island Lighthouse and Keeper's Quarters (#08103A, LCS 006390)**

Originally constructed in 1862, this building was completely reconstructed in 1906 to provide living quarters for a third assistant. The current appearance of the building reflects the period 1906-1947. The building is two stories in height, with a square light tower centered on the front (west) façade (Figure 55). It has a brick foundation, clapboard wood siding, and hipped roofs covered with embossed metal shingles. Due to historic circulation patterns within the lighthouse yard, and the erosion of the bluff west of the building, the lighthouse is best viewed from the water.



Figure 55. West façade of lighthouse, 1988 (Lakeshore archives).

This building is the highlight of the island's interpretation. At present the keeper's quarters in the south half of the lighthouse serve as the focal point of the island tour. This space is interpreted to the 1914-1924 period of Keeper Lee Benton. The north half of the building is currently not used and was modified in the 1960s.

A Historic Structure Report for this building was completed in 2000 by Quinn Evans Architects of Ann Arbor, Michigan. This document provides detailed information on the history and existing condition of the building and provides design recommendations for the proposed reuse of the building as a combination interpretive museum space (south half) and NPS living quarters (north half).<sup>166</sup>

The building is in fair condition. Current exterior needs include limited repair of damaged wood siding, paint, gutters, and window and door weatherization (Figure 56). Interior spaces display damaged plaster.

#### **Fog Signal Building (#09102B, LCS 006392)**

This one and one-half story brick building was constructed in 1903 to house a steam-powered fog signal. It has a hipped roof with a prominent dormer that was added in 1932 to the west façade. The dormer provided interior space to accommodate the compressed air-powered diaphone equipment, which has since been removed. The I-beam reinforcements visible on the west façade date from 1925.

The interior of the building is used for storage and is not interpreted to the public, though some elements of its historic use remain extant, including the tank saddles and portions of the Kohler battery bank. The hoist room for the tramway is located at the south end of the building, with the tramway cables passing through an opening in the west façade.

The fog signal building, along with the lighthouse, is clearly visible from the water. The dock and tramway stairs that provide the principal visitor access to the island are located directly below this building. Accordingly, it serves as the public's first introduction to the light station clearing as they ascend from the dock.

The building is in good condition and has received major stabilization over the years. A covered cistern associated with the original 1903 steam fog signal is located on the west side of the building (Figure 57).



Figure 56. Damaged siding. North façade of lighthouse, 2003.

---

<sup>166</sup> Quinn Evans Architects, *Historic Structure Report: Raspberry Island Lighthouse* (2000).





Figure 57. West (front) and north facades of fog signal building, 2003

### **Oil Building (#08102H, LCS 006375)**

The single story brick oil building was built in 1901 and is located immediately east of the southeast corner of the fog signal building. The building is not open to the public; however, its historic function is an integral part of island interpretation. The building is in good condition and is flanked by two pairs of concrete tank cradles that once supported fuel tanks (Figure 58).

### **Barn (#08102C, LCS 006393)**

The one and one-half story wood frame barn dates from ca. 1906. The building has a side-gabled roof and is clad with board and batten siding. Remnants of a wood plank walkway lie immediately in front (west) of the building entry. This building has been identified by a number of historic names, including "barn," "warehouse," and "shop." It is unclear whether or not the building ever served as a barn, providing shelter for livestock, but it has clearly served as a warehouse and shop building. In the 1960s Ellerbee Architects converted the building into living quarters for the island caretakers. The building presently provides housing for seasonal Lakeshore staff. The exterior of the building is currently used in interpretation to the extent that it conveys the rural, self-sufficient nature of life on the island. The barn is in good condition (Figure 59).



Figure 58. Side and front (west) facades of oil building, 2003. Note concrete tank cradles north of building.



Figure 59. Front (west) and south facades of barn, 2003.

#### **Shed #1 (#08102G, LCS 006374)**

This single story, front gabled, wood frame and clapboard sided building is located between the barn and the keeper's privy (Figure 60). The building is referred to by a number of names in historical documents and served a variety of functions. It appears to date from the first period of development on the island and may have served as a shed during this period. It later served as a carpenter shop, washhouse/laundry, and as a second



Figure 60. Side and front (west) facades of Shed #1, 2003.

assistant keeper's quarters. Although the 1906 lighthouse was designed to provide living quarters for the second assistant, the shed was occasionally used for that purpose. Renovations by Ellerbee Architects in the 1960s introduced new interior finishes. The presumed use of the building as a summer kitchen and alternative to lighthouse living is included in interpretation of the site. The building is in good condition.



### **Keeper's Privy (#08102E, LCS 006395)**

The keeper's privy is located directly east of the lighthouse; in line with the rear entry to the keeper's quarters in the south half of the building. The privy is a single story, wood frame, front gabled building with clapboard siding and embossed metal roof shingles. This building is associated with the initial period of site development. Although its date of construction is unknown, it may be the oldest extant building at the site. The privy was placed upon a new poured concrete foundation by the NPS. This building is used in interpretation of the site as it illustrates, along with the assistant keepers' privy, the hierarchical nature of life on the island and the separation of space along familial lines. The building is in good condition (Figure 61).



Figure 61. Side and front (west) facades of keeper's privy, 2003.

### **Shed #2 (#08102F, LCS 006396)**

Shed #2 is a single story, wood frame, side-gabled building located between the two privies. The siding consists of board and battens. The roof is clad with embossed metal shingles. The building appears to date from 1904. It sits low to the ground and shows signs of considerable deterioration along its foundation. It is in need of significant repair and maintenance and is in poor condition. It is currently interpreted as part of the lighthouse cluster of buildings (Figure 62).



Figure 62. Front (west) and south facades of Shed #2, 2003. Note deterioration of board and batten siding at the base of the building due to poor drainage.

### **Assistant Keepers' Privy (#08102D, LCS 006394)**

The assistant keepers' privy is located in the northeast corner of the formerly fenced lighthouse yard. This privy, apparently built ca. 1906 when a second assistant keeper was assigned to the station, is single story, wood frame, side gabled building with clapboard siding. The roof is covered with non-historic rolled roofing. Remnants of a wood plank walkway lie within the path leading to this building. This building is in good condition, and like the keeper's privy, illustrates the hierarchy of station life and separation of private spaces (Figure 63).

### **Water Tank and Solar Shower**

Immediately east of the barn is the water tank and solar-heated outdoor shower constructed by the NPS in 1982. The building has board and batten siding and a gabled roof, and is designed to blend in with the historic buildings. The building is in good condition (Figure 64).

### **Boathouse (#08102K, LCS 101623)**

The present single story wood frame boathouse appears to represent a major 1940s reconstruction of an earlier structure. Significant portions of the walls and foundation are identified as belonging to older versions of the structure.<sup>167</sup> The boathouse is a gable-roofed structure with board and batten siding and rolled roofing. Two large wood plank doors in the west façade swing outwards to provide access to the boat slip inside the building. The structure is continuously exposed to water and moisture and has experienced considerable deterioration as a result.

A boathouse existed on the island by 1878. Historic photographs (see Figure 10) from the early 1890s do not indicate a boathouse at the station dock, so this first structure was likely located at the sand point. Nevertheless, a boathouse was established at



Figure 63. Front (west) and south facades of assistant keepers' privy, 2003.



Figure 64. North facade of water tank and solar shower, 2003.

---

<sup>167</sup> U.S. Coast Guard, "Raspberry Island Light Station – Boat House As-Built" (28 October 1943). Architectural drawing on file at the park library.

its present location by 1894 when it was moved in association with the extension of the dock. The structure was regularly rebuilt, repaired, and modified over the historic period as harsh weather and operational needs dictated.

The present boathouse is in fair condition and continues to require constant upkeep due to its extreme exposure to the elements. Its appearance and function are representative of the boathouses that existed at the site throughout the historic period. It is not actively interpreted (Figure 65).

**Dock (#08102A, LCS 006391)**

The first station dock was built in 1868. Similar to the associated boathouse, the structure has been rebuilt, repaired, and modified on numerous occasions. The present dock, consisting of rubble filled stone crib substructure and wood superstructure, was constructed by the National Park Service. Its location and configuration approximate that of the historic structure. The dock is regularly maintained and is in good condition. It is not actively interpreted. As the landing site for most island visitors, it is easily included in the interpretation of the island experience as the historical approach to the lighthouse complex atop the bluff (Figure 66).



Figure 65. Front (west) and south facades of boathouse, 2003.



Figure 66. View to northwest of dock cribs, 2003.

## Steps and Tramway (#08104B, LCS 101624)

The existing concrete stairs and tramway date from 1932. A wood tramway was originally constructed in 1902 prior to construction of the fog signal building. The present tramway consists of 76 concrete steps extending from the edge of the bluff to the boat dock. The concrete steps serve as the foundation for the tram and are flanked by metal tracks that carry the tramcar. The north side of the stair has a metal handrail that extends the length of the stair. Visitors use the stairs to access the lighthouse yard from the dock. The tram is an important feature in interpretation of the site as it illustrates the evolution of access to the lighthouse station. This structure is in fair condition due to its age and exposure to the elements (Figure 67).

## Vegetation

The vegetative communities present on Raspberry Island differ dramatically between the areas designated in this report as forest, clearing, and yard. Native vegetation is extremely diverse, consisting of 266 vegetative species, 50 percent more than would typically be expected for an island of this size.<sup>168</sup> The northern white cedar-yellow birch community covers the largest area, including most interior portions of the island designated as forest. This community consists primarily of white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), and white (*Betula papyrifera*) and yellow birch (*Betula alleghaniensis*), with an understory dominated by Canada yew (*Taxus canadensis*), and is believed to represent a pre-settlement forest remnant. Sugar maples (*Acer saccharum*), hemlock (*Tsuga mertensiana*), basswood (*Tilia americana*), red oak (*Quercus rubra*), showy mountain ash (*Sorbus sitchensis*), and black ash (*Fraxinus nigra*) are also present. Other vegetative communities present outside the light station clearing are located near the perimeter of the island and occupy much smaller areas. For example, the cusped foreland and enclosed bog occurring in the southeast corner of the island support dune vegetation dominated by beach grass (*Ammophila breviligulata*), common hairgrass (*Deschampsia flexuosa*), sand cherry (*Prunus pumilla*), beach pea (*Lathyrus japonicus*), smooth rose (*Rosa blanda*), and bearberry (*Arctostaphylos uva ursi*), while the back



Figure 67. Steps and tramway. View to east, 2003.

---

<sup>168</sup> Judziewicz and Koch, *Flora of the Apostle Islands* 32; Richard W. Dobie, *The Vegetation Ecology of Raspberry, Rocky and York Islands, Apostle Islands National Lakeshore, Wisconsin*, 1977, MS thesis, Michigan Technological University.



side of the dunes harbor white spruce (*Picea glauca*), black ash, white pine (*Pinus monticola*), quaking aspen (*Populus tremuloides*), balsam-fir, pin cherry (*Prunus pensylvanica*), bastard-toadflax (*Commandra umbellata*), and wintergreen (*Gaultheria procumbens*).

Although Raspberry Island was never logged commercially, for over eighty years station keepers cut wood for both domestic and industrial use. Periodically, the Keepers' logs note 'roads' being cleared into the forest for wood harvest. These roads, and the woodlots they accessed, have been allowed to regenerate at a natural pace and are no longer visible to the untrained eye.

Vegetation has been part of the recent mitigation work on the bluff west of the lighthouse and fog signal. Upon completion of the revetment, fascines of willow (*Salix* sp), speckled alder (*Alnus incana* sp. *rugosa* sp.) and red osier dogwood (*Cornus stolonifera*) were planted on the slope above the riprap. The higher slope plantings include red elderberry (*Sambucus racemosa*), staghorn sumac (*Rhus typhina*) and wild strawberry (*Fragaria Virginiana*), Canada wildrye (*Elymus canadensis*), poverty oatgrass (*Danthonia spicata*), panicgrass (*Panicum lanuginosum*) and wild rose (*Rosa blanda*). This effort represents a thoughtful installation of native species, grouped by height at maturity, designed both to help assure slope stability and to preserve unobstructed views and site lines from directly in front (west) of the lighthouse building cluster.

Currently, the Lakeshore manages vegetation only within the former lighthouse yard, principally by mowing the extant lawn, which is comprised of exotic grass species. The yard fence that separated the yard from the remainder of the station clearing is no longer extant. This boundary is presently marked by a band of red osier dogwood and thimbleberry (*Rubus parviflorus*) – pioneer species that advance in front of the edge of the secondary birch and aspen forest, which has reestablished itself within the remainder of the clearing. Routine lawn maintenance has kept the dogwood at bay, but it is encroaching onto the north end of the lawn. Some areas are also subject to invasions of Japanese knotweed, which have been periodically treated with herbicides.

In addition to the lawn, the lighthouse yard also contains fourteen cobble-lined flowerbeds, mostly located in the front (west) and to the sides (north and south) of the lighthouse, with the remainder located in the north and northeast corners of the yard. The majority of these beds were reconstructed in the 1980s based upon oral history and historic photographs. The gardens are interpreted as ca. 1920s gardens. These gardens were reconstructed prior to formulation of current NPS reconstruction standards. While some genera are present in historic photographs, the overall reconstruction does not comply with current standards.

The small flowerbeds are planted with hosta (*Hosta* sp.), iris (*Iris* sp.), columbine (*Aquilegia Formosa*), lilacs (*Syringa* sp.), and tiger lilies (*Lilium columbianum*), sweet william (*Dianthus barbatus*), roses (*Rosa* sp.), shasta daisy (*Leucanthemum × superbum*), Phlox P. carolina (*Phlox subulata*), pinks (*Dianthus* sp.), hardy clove (*Eugenia caryophyllus*), lupine minarette (*Lupinus* sp.), peonies (*Paeonia officinalis*), morning glories (*Calystegia macrostegia*), American highbush cranberry (*Viburnum trilobum*), perennial sweet peas (*Lathyrus ochroleucus*), pompom dahlias (*Dahlias* sp.), cactus dahlias (*Dahlias* sp.), burgundy gaillardia (*Gaillardia x grandiflora*), rudbeckia (*Rudbeckia* sp.), sweet alyssum (*Lobularia* sp.), snap dragons (*Antirrhinum majus*), nasturtium (*Nasturtium officinale*), marigolds (*Calendula* sp.), pansies (*Viola* sp.), and zinnias (*Zinnia* sp.). Not all these species or beds can be verified by historic photography or Keepers' log entries.

Large circular flowerbeds at the north and east edge of the yard contain daylilies and asparagus (*Asparagus officinalis*). Lilies are also present in the foundation plantings on the west side of the lighthouse. These beds and planting material are evident in several historic photos.

Ornamental trees currently on site include cherry (*Prunus* sp.) and mountain ash. Three mountain ash are present in the lawn west of the light house. The two southern trees, although recent replacements, can be verified for placement in period photos. The third mountain ash located at the northwest corner of the lighthouse is severely damaged as a result of the loss of a major branch, equaling approximately half the tree. This placement does not appear in historic photos, the tree possibly dates to ca. 1960s.

One large reconstructed vegetable plot is tended in the area west of the barn. This vegetable patch is associated with a grape vine (*Vitus* sp.) and arbor that were introduced to the site in the 1980s.

Current interpretation focuses on the flowerbeds, which are not completely accurate in placement or content. The succession growth into the clearing prohibits interpretation of the area, its relationship and importance to navigation, and subsistence agriculture that occurred on the site. Vegetation, in general, is in fair condition. Factors contributing to this condition include the severely damaged mountain ash, the secondary succession of pioneer species into the historic clearing, and the lack of historical accuracy in portions of the restoration work. A full analysis and evaluation of the station's vegetation may be found at 4.8.1 below.

## Views and Vistas

The most significant views at Raspberry Island are those from the lighthouse tower and those from the water as one approaches the station dock (Figure 68). The current view from the lighthouse tower is significantly less expansive than during the period of manned operation, largely as a result of secondary forest encroachment into the historic light station clearing. The historic arc of the light covered 195 degrees between roughly 145 and 340 degrees.

This arc was established by creation of the clearing, which was faithfully maintained until the 1950s. The present unobstructed view from the tower covers only about a 30-degree arc towards the lake, between 235 and 265 degrees.



Figure 68. View to south from lighthouse, 2003.

Existing views from the tower and the yard to the north, east, and south – in essence all views not directly oriented towards the lake – are constrained by the secondary succession forest encroaching into the station clearing (Figure 69). The 'clearing' is cluttered with scrub and invasive species whose height constrains views.

As noted above, one of the most important views of the station is from the water. This view remains, although erosion of the bluff has changed the

relationship between the lighthouse and the fog signal building and the face of the bluff. The fog signal building and lighthouse are now located much closer to the edge of the bluff than at any point in the history of the station. Indeed, the historic location of the station's principal flagstaff appears to have eroded into the lake on more than one occasion. The recent stabilization of the bluff has created a feature characterized by riprap and a planted slope. Its appearance differs somewhat from the natural bluffs visible from the water to the north and south of the station clearing (Figures 70 and 71).



Figure 69. View to north from clearing, 2003.

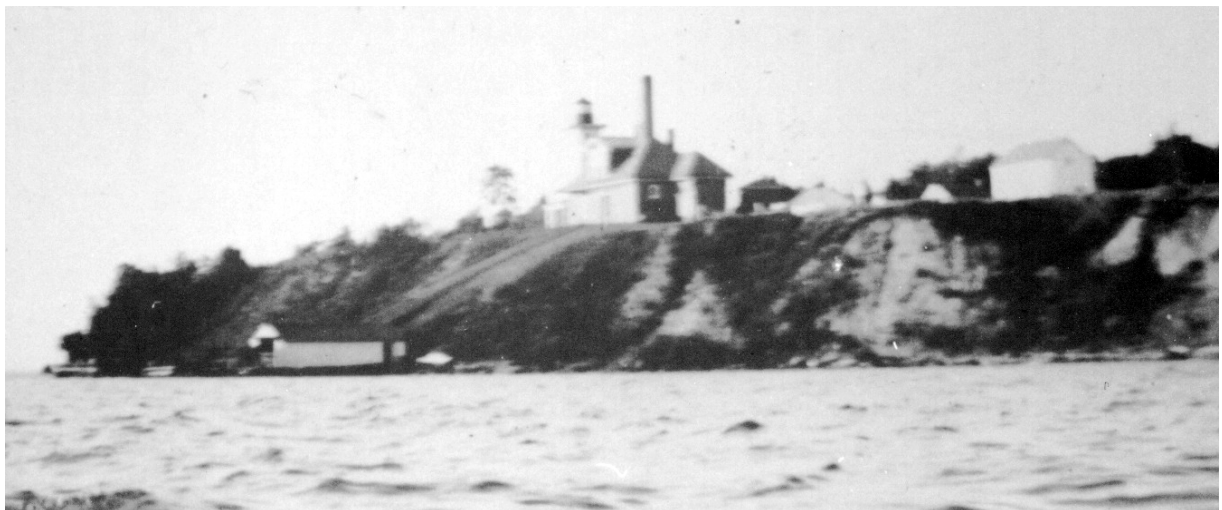


Figure 70. View to northeast showing extant of clearing and condition of bluff, ca. 1932-1944 (Lakeshore archives).





Figure 71. View to east from lake, 2003.

The initial views of the lighthouse yard experienced by visitors are from either the head of the tramway stairs or the end of the trail leading to the sand point. Both these locations offer views that emphasize the working nature of the site. The view from the top of the tramway is framed by the oil building and fog signal building and offers a side view of the lighthouse and a perspective of the outbuildings. The view from the end of the sand spit trail is even more utilitarian, since the trail enters the yard area south of the barn and offers a foreground view of ancillary buildings with the rear (east) façade of the lighthouse in the middle distance.

Other significant views from within the yard include those from the top of the bluff, which have been affected by erosion. The space in front (west) of the fog signal building and lighthouse is much reduced in area, limiting views of the front facades of these buildings. Views of the lighthouse yard from the lighthouse tower include the extant historic buildings and structures and the reconstructed garden plots. Modern elements, such as the water tank/solar shower and pit toilets are hidden from view by vegetation or historic buildings. Interpretive efforts at the light station emphasize the historical sweep of the light as an important aid to navigation and, necessarily, discuss the views from the lighthouse.

## Small Scale Features

All historic small-scale features at Raspberry Island Light Station are located within the light station clearing and lighthouse yard. These features include items associated with the operation of the light station and the domestic life of the station's inhabitants. Several of these features, especially those made of wood, are in poor condition and in need of immediate stabilization efforts. The small-scale features are described below in an order that approximates the order in which a visitor might encounter them after arriving at the Raspberry Island boathouse. The order of description basically moves from west to east within the lighthouse yard. Small-scale features located outside the yard, within the historic boundaries of the station clearing are discussed last.

### **Walks (#08104A, LCS 101630)**

The site originally included a network of cement, wood plank, and cinder walkways. Only the cement walkways, installed ca.1906 and repaired on numerous occasions, are extant. Some of the cement walks form a continual path while others are arranged like stepping-stones. The walks are in fair condition, though grass has been allowed to cover the edges of the walks, visually reducing their apparent width. The walkways help illustrate the daily patterns of circulation on the site (Figures 72 and 73).



Figure 72. Concrete path leading to rear of lighthouse. View to northeast, 2003.



Figure 73. Concrete path from keeper's privy to shed #1. View to south, 2003.

### **Light Beacon**

The Coast Guard light beacon located west of the fog signal building was installed in 1948 (see Figure 40). It consists of a metal pole with a solar panel, and equipment box, and the light beacon. It is maintained in good working condition and is useful in interpreting the decline of historic lighthouse lifestyles and operations, and the resulting change in the view shed.

### **Cistern (#08104C, LCS 101628)**

The cistern located in front (west) of the fog signal building dates to the original 1903 construction of the building. It provided water, siphoned from the lake, for the boilers that powered the steam whistle. The cistern consists of a poured concrete hexagonal base with a raised circular element. During the historic period it was capped by a hand pump. The cistern does not appear to be actively included in interpretive programs. It is in fair condition (Figure 74).



Figure 74. Cistern. View to southeast, 2003.

### **Flagstaff**

The station flagstaff formerly stood directly west of the lighthouse building at the edge of the bluff. The pole was removed prior to the initiation of the bluff revetment. The existing wood pole is in poor condition and is presently cached in the bushes just northwest of the lighthouse.

### **Concrete Oil Cradles (#08104E, LCS 101627)**

Two sets of concrete oil cradles flank the oil building to the north and south. These originally supported fuel oil tanks. The cradles are useful in understanding the spatial relationship and function of the oil building. They are in good condition (Figure 75).



Figure 75. Concrete oil cradles. View to northwest, 2003.

### **Drainage Trough**

Clay soils and minimal slope contributed to drainage problems throughout the historic period. Remnants of the historic drainage system line the walkway east of the fog signal building. The cement trough conveys the measures that lighthouse residents took to relieve the site's drainage problems. The trough is presently non-functional, with grass growing between the segments of concrete, and therefore



does not contribute to interpretation. It is in poor condition (Figure 76).

Additional drainage features include a narrow drainage ditch that runs along east edge of the lighthouse yard. The present ditch was created by the NPS. A drainage ditch is indicated in the approximate location of the present feature on 1912 site plans and may have existed prior to that date. The existing ditch consists of a rough-cut trench measuring about one foot wide and 8 inches deep. This feature is minimally maintained, yet functional. Grasses are allowed to grow up around the ditch concealing its presence. This feature is not actively interpreted and is in fair condition.

### **Grape Arbor**

The grape arbor is located along the west edge of the vegetable garden plot. It consists of three white-painted poles, connected by wire for supporting vines. A birdhouse is situated on top of the middle pole. The grape arbor was installed during the 1980s garden restoration and appears to have no historical precedent in either written or photographic records. It first appears in a 1984 photograph.

The arbor is used in interpretation of the garden spaces and is in good condition (Figure 77).

### **Pole Supports**

A pair of wooden poles, approximately six feet in height, are located between the fog signal building and the reconstructed vegetable garden. The poles appear to have flanked and supported a taller pole, presumably used as a secondary flagstaff in the 1930s, and possibly used as a radiophone antenna in the late 1940s. This feature is not actively interpreted. It is in fair condition (see Figure 77).



Figure 76. Drainage trough and cement walkways. View to north, 2003.



Figure 77. Grape arbor and pole supports. View to east, 2003.

## Swing

A swing existed in the lighthouse yard from as early as 1900. The existing swing is an NPS reconstruction dating from the 1970s. It is located near the northeast corner of the lighthouse and is, according to photographic evidence, in approximately the location of the historic swing. It consists of two tall poles with a crossbar from which the swing is suspended. The present swing is very tall by modern standards; yet historic photos reveal that the historic swing stood much higher. It is in fair condition and contributes to the interpretation of family life and entertainment at the lighthouse (Figure 78).



Figure 78. Swing. View to northwest, 2003.

## Clothesline

The clothesline is located at the east edge of the yard. It consists of three cedar poles with crossbars, and appears to date from ca. 1939. Clotheslines existed in this approximate location for many years, and during at least the 1930s a wood walkway paralleled the clothesline. The clothesline was replaced on several occasions according to the Keepers' logs. Though there is no record of the exact placement of earlier clotheslines, this location is well documented in period photographs. The presence of the clothesline adds to the interpretation of daily routines of island life. The clothesline is in fair condition (Figure 79).



Figure 79. Clothesline. View to north, 2003.



## Weather Station

The weather station is located in the historic clearing, east of the keeper's privy. It consists of a wood post topped by a wood box that at one time contained the station instruments. The US Coast Guard erected the weather station in the 1940s. The station is in an area of overgrowth and is inaccessible to the public. It is not currently operational and is not included in interpretation of the site. This feature is in poor condition (Figure 80).

## Bird House

A birdhouse is mounted on a pole southeast of the barn. Birdhouses are mentioned in 1931 logbook entries, but may have existed on the site much earlier. The current birdhouse is sited in accordance with historic photographs and was constructed by NPS staff some time in the 1970s. It is not actively incorporated into the interpretive program. The birdhouse and pole are in fair condition (Figure 81).



Figure 80. Weather Station.  
View to west, 2003.



Figure 81. Bird House. View to east, 2003.

## Range Marker

Located within the historic clearing, inside the edge of the encroaching woods near the start of the trail to the sand point, the range marker is one of two historic range markers erected on the island in the 1930s. The range markers provided a visual, daylight reference for passing ships that allowed navigators to determine whether they were within the main navigation channel. The remaining marker consists of a cedar pole with a diamond-shaped device made of rough lumber.



The second marker, no longer extant, was located to the west and was of similar design and construction. The marker is an important feature for interpreting the history of navigation, but is not currently included in any programs. It is in poor condition, and because it is partially hidden by vegetation, it is not visible from either the lighthouse yard or the lake. (Figure 82).



Figure 82. Range marker. View to west, 2003.

### **Interpretive Signage**

Interpretive and informational signs are located at the southeast edge of the yard (see Figure 44). These signs are a recent NPS addition to the site. The signage is in good condition, yet conveys information that is no longer relevant as it summarizes 'current' bluff projects that were completed in 2003.

### **Pit Toilets**

Two pit toilets, located south of the lighthouse yard, are provided by NPS for public use. These modern facilities are not readily visible from the lighthouse yard and do not interfere with current interpretive programming. They are in good condition.

## Archeological Features

### Root House

Root houses or earth storage existed at the site as early as 1896.<sup>169</sup> The 1935 Keeper's log notes the addition of a root house in the woods behind (east) of the dwelling. The remains of such a historic resource were recently located and mapped by Historical Research Associates (HRA) staff during preparation of this Cultural Landscape Report. The roof has collapsed, reducing the structure to a ruin. Artifacts are scattered around the site. No archeological investigations have been conducted at this feature, and its contents, if any, have not been documented. The root house is in poor condition and is not currently part of island interpretation.

### Plank Walks

Wood plank walkways are first mentioned in the Jacker diary in 1886 and were maintained throughout the historic period. In the 1930s a wood plank walk paralleled the clothesline. One badly deteriorated section of plank walkway survives, partially buried in the lawn, near the entry to the assistant keepers' privy. Another remnant appears to exist immediately in front of the entry to the barn. These partially exposed resources could be negatively affected by lawnmowers. This resource is not interpreted and is in poor condition (Figure 83).



Figure 83. Remnant of plank walkway. View to southwest, 2003.

---

<sup>169</sup> Keeper's Log abstracts, Oct 21, 1896, Nov 11, 1900.



## Chapter 4: Landscape Analysis and Evaluation

### Introduction

The analysis and evaluation of the Raspberry Island Light Station compares findings from the site history and existing conditions assessment to identify those landscape characteristics and associated features that have historical significance. Each landscape characteristic is analyzed based on what was present historically and what currently remains in the landscape. The historic integrity and significance of each landscape characteristic and associated feature are then evaluated within the context of the broader landscape. Seven character-defining components have been documented and evaluated using National Register eligibility criteria. Based on this evaluation, cultural landscape character areas have been identified as a way to consolidate findings from the evaluation, and provide guidance for the development of treatment strategies.<sup>170</sup>

### Statement of Significance

The Raspberry Island Light Station was included in a National Register of Historic Places nomination of the Apostle Island Lighthouses listed in the National Register on March 8, 1977. A National Historic Landmark (NHL) nomination is currently being prepared for the Apostle Island Light Stations. The following statement of significance summarizes that of the draft NHL nomination.

The Apostle Island Light Stations have been described as the "largest and finest collection of lighthouses in the United States."<sup>171</sup> The nine standing lights and the ruins of a tenth offer a cross-section of construction types and architectural styles that illustrate the evolution of American lighthouse design. The light stations are closely associated with the development of the U.S. Lighthouse Service and the national importance of commercial maritime traffic on the Upper Great Lakes beginning in the mid-nineteenth century and continuing well into the twentieth century. The wealth of historical documentation associated with the light stations provides valuable insights into the lives and work of lighthouse keepers and their families, contributing to our understanding of this social group.

While numerous lighthouses have been preserved throughout the United States many of these properties exist in isolation, having lost the ancillary support buildings that existed at the site when the light was manned. These outbuildings, and the landscape in which they and the lighthouse exist, provide the context required to fully interpret the property's history and

---

<sup>170</sup> Page et al., *Guide to Cultural Landscape Reports: Contents, Process, and Techniques*, 75

<sup>171</sup> F. Ross Holland, Jr., *Great American Lighthouses* (New York: John Wiley & Sons, 1994), 256.

significance. In contrast, according to the draft NHL nomination, "the cultural landscape of the Apostle Islands Light Stations remains remarkably intact."<sup>172</sup>

The Raspberry Island Light Station is significant as part of the collection of Apostle Island light stations. It is closely associated with the introduction of navigation aids in the Apostles and, as such, is linked to the history of navigation and maritime commerce on the Upper Great Lakes. The station's physical plant illustrates technological changes that occurred throughout the Lighthouse Service, including the substitution of kerosene for lard oil as the source of illumination for the light, the introduction of steam-powered fog signals, the later replacement of steam with compressed air, and the eventual replacement of manned stations by unmanned, automated systems. The Raspberry Island Station also provides an excellent window into the patterns of work and life that characterized island residents over a period of more than fifty years.

The period of significance established in the draft NHL nomination for the Apostle Island Light Stations extends from construction of the first lighthouse to the end of U.S. Coast Guard management and operation. Utilizing these parameters for Raspberry Island, the period of significance for the station extends from 1862-1947. The present built environment at the Raspberry Island Station, including the buildings and structures, principal circulation routes, and garden plots, largely dates from the second period of development at the station. This period, which began with construction of the fog signal building in 1902 and extended through the cessation of Coast Guard management in 1947, constitutes the primary period of interpretation for the station.

## Natural Systems and Features

The natural systems and features that influenced development at Raspberry Island included the topography of the island and its location adjacent to an important shipping lane, the West Channel.

The level, elevated bluff that rises forty feet above the water's edge at the west end of the island – directly adjacent to the navigation channel, provided a perfect site for the lighthouse and its supporting infrastructure. The only natural feature that limited the utility of the site was the native forest, which extended to the edge of the bluff. Once the native vegetation was cleared, the new lighthouse atop the bluff could cast its beam northward into Lake Superior proper and west and southwest into the West Channel. The native forest also made Raspberry Island attractive for use as a light station because it provided a wood reserve for the use of the station's occupants. The island offered both hard and soft woods, differentially harvested for use in kitchen stoves, and, after 1903, as reserve fuel for the fog signal boilers.

The bluff also constituted an obstacle as well as an opportunity, since its height hampered the transfer of equipment, supplies, and personnel from the water's edge to the top of the bluff. Consequently, throughout the early history of the station, the sand spit at the southwest corner of the island served as an alternative landing site for material that proved difficult to move up or

---

<sup>172</sup> Männikkö and Mackreth, "Apostle Islands Light Stations National Historic Landmark Nomination," 20.



down the bluff. Construction of stairs at the bluff, later replaced by a wood, and still later a concrete tramway, made the bluff a less significant obstacle to the movement of people and material, although the sand spit landing remained a valuable alternative during heavy weather because of its sheltered location.

Historic maps from 1877 (see Figure 6) and 1910 (Figure 84) indicate that the topography of the island has experienced little change since establishment of the station, with the exception of the erosion of the bluff immediately west of the lighthouse. Within the station clearing the land slopes from east to west (from the historic edge of the clearing towards the bluff) at an approximate rate of 1:10 (Figure 85).

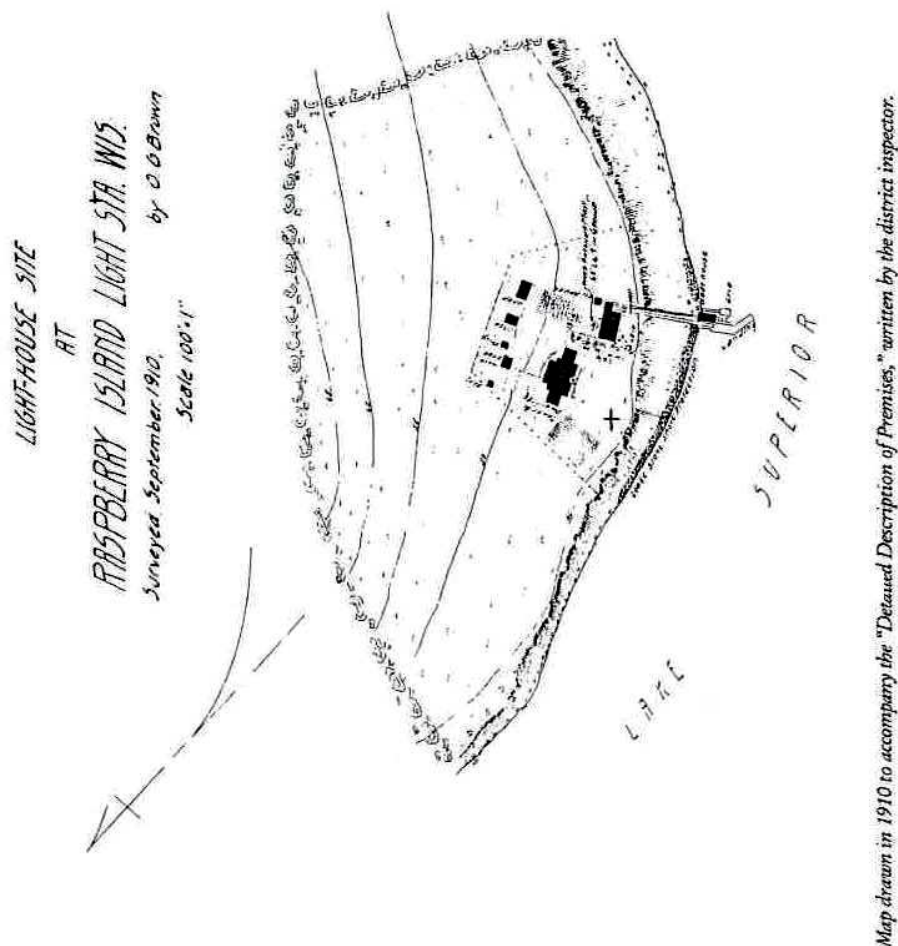


Figure 84. 1910 site map showing topography. Note location of yard fence and extent of

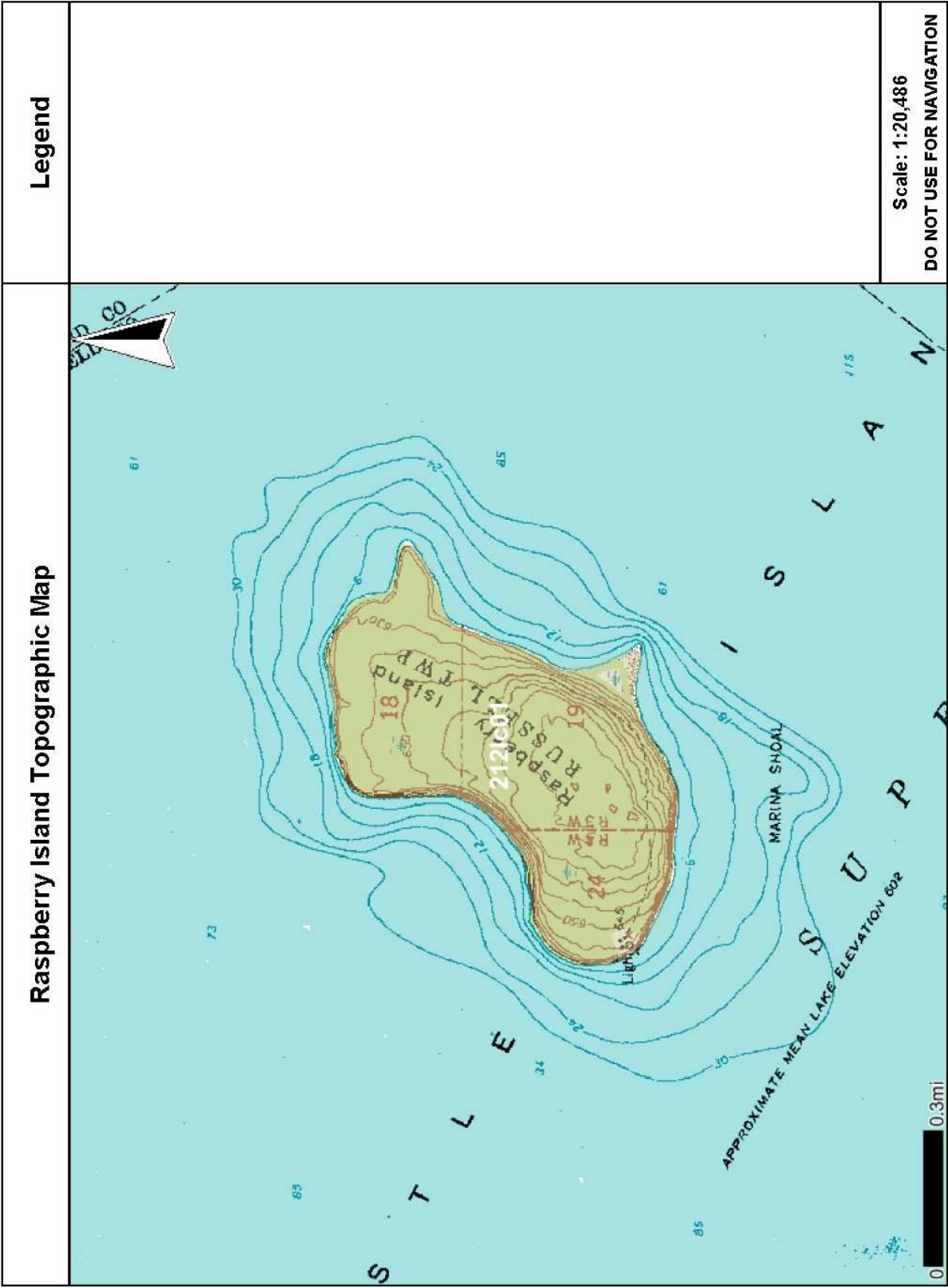


Figure 85. Current topography map.

Erosion of the bluff, as a result of both natural and human forces and human efforts to stem this erosion, has significantly altered the bluff face. Erosion has significantly altered spatial relationships in the lighthouse yard by eliminating a strip of level ground twenty to forty feet in width from the area immediately west of the lighthouse and fog signal building (Figure 86)

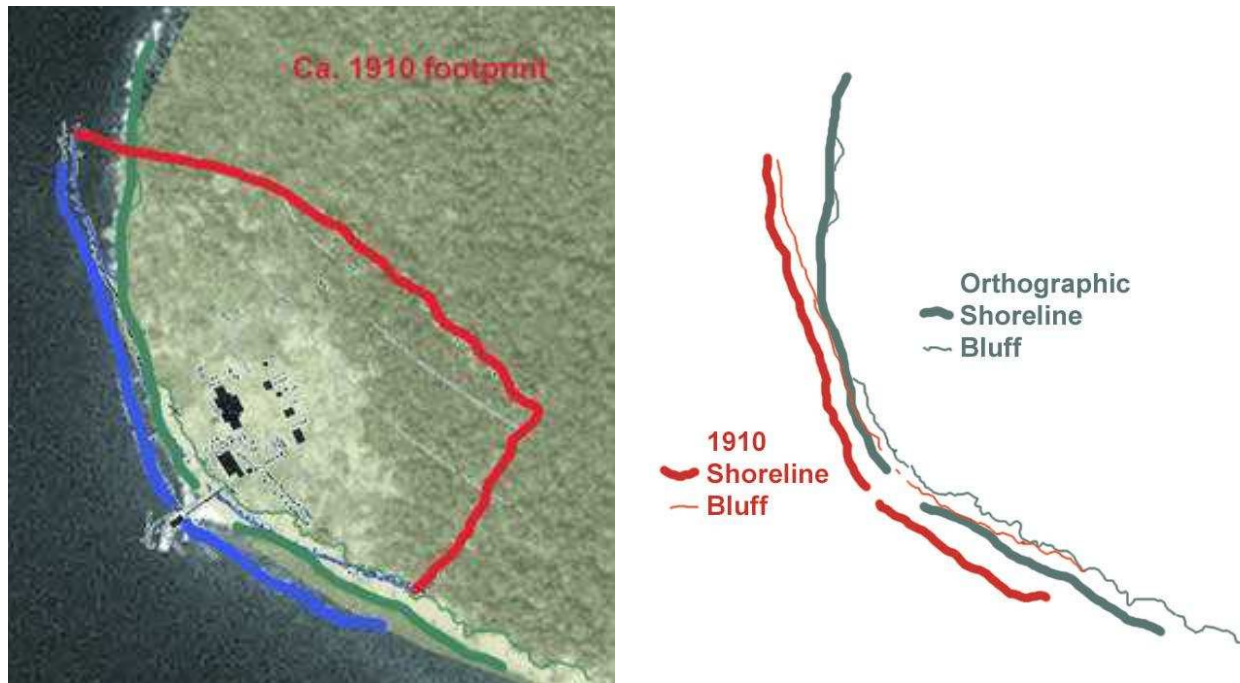


Figure 86. Change in shoreline and bluff. Comparison of 1910 map with ca. 1990s aerial photograph.

Human activities contributed to the erosion of the bluff face. Construction of the stairs and tramways that extended from the dock to the bluff top affected the appearance and stability of the bluff. Drains from the lighthouse yard emptied onto the bluff face, promoting erosion. Keepers periodically cleared brush from the slope to preserve the unobstructed sweep of the light. In the 1930s the Keepers' logs contain numerous references to erosion control efforts on the bluff. These efforts included planting grass seed, laying sod, adding soil, planting trees, and construction of flower beds. Historic photographs (Figure 87; see also Figures 7, 9, 10, 20, 29, 33, 36, 37, 41 and 43) depict a bluff with a steep slope; somewhat lined with erosion channels, and partly covered with low vegetation.

A 1910 map (see Figure 84) of the site indicates that measures were taken at an early stage to address the erosion of the bluff. The map highlights 'loose stone shore protection' placed to the north and south of the dock. Since the island has been under NPS management, the Lakeshore has consistently taken measures to curb bluff erosion, especially immediately west of the historic building cluster. In the 1980s the Lakeshore built a low riprap wall that proved unsuccessful. Most recent changes, completed in 2003, include the addition of nearly forty feet of material to the base of the bluff and construction of a stable slope planted with native vegetation (Figure 88; also see Figure 50).

The large-scale landforms that led to selection of Raspberry Island as the site of a light station remain intact today, and contribute to the historical significance of the property in regards to location, design, and setting. The steep bank upon which the lighthouse is located has been affected by erosion, and while recent stabilization efforts have somewhat altered the historic appearance of the bluff they will arrest further deterioration of the landform and prevent further degradation of this landscape feature. The island continues to support a diverse forest of native trees, similar to its condition in the mid-1850s. Aspects of materials, workmanship, and association remain intact, while integrity is low in the area of feeling due to the regeneration of second growth forest in the clearing.

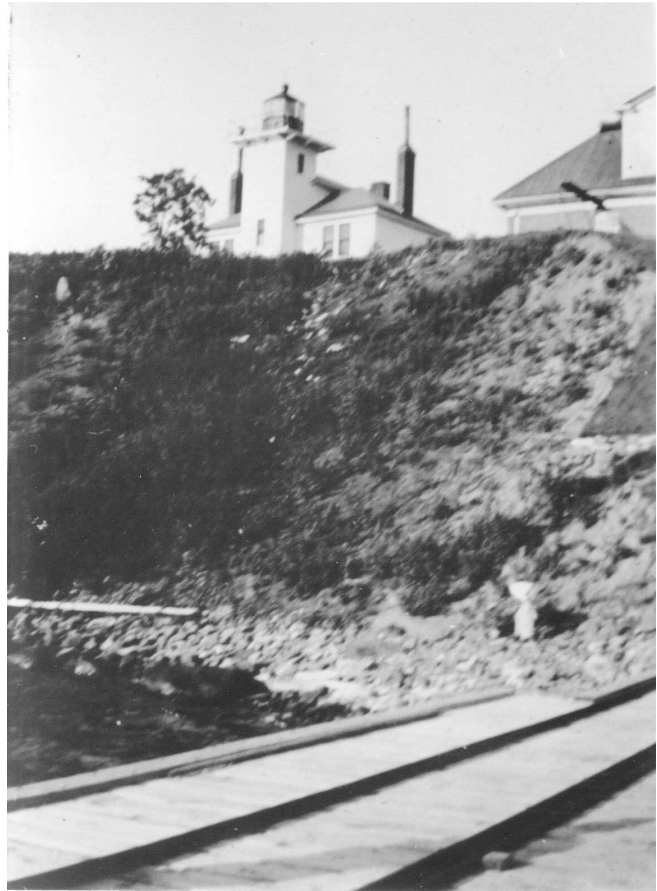


Figure 87. Bluff conditions. View to northeast, post-1932 (Lakeshore archives).



Figure 88. Bluff conditions, 1977 (Lakeshore archives).



## Spatial Organization

Historically the Raspberry Island Lighthouse Station was organized into three primary landscape areas: the main building cluster defined by a fence and generally known as the lighthouse yard, the larger station clearing that surrounded the yard, and the island's remaining approximately 280 forested acres. The lighthouse yard was the heart of the station and included nearly all of the station's buildings and structures, as well as associated paths, walkways, lawns, gardens, and other landscape elements. The clearing, created to provide the required arc for the light, was cultivated as hay fields and strawberry patches at various points in the station's history. Any use of the clearing had to accommodate the need to provide a clear arc for the sweep of the light. The remainder of the island was largely left undeveloped. The forest provided timber for construction and firewood for island stoves and boilers. Island residents established paths that led to woodlots and berry patches, as well as to the sand spit landing and the Sand Island observation point.

The organization of yard, clearing, and forest remains readily apparent. The lighthouse yard retains high integrity from the station's second period of development (1902 to 1947). The fence that historically separated the yard from the clearing is no longer extant, which somewhat obscures the boundary between the two areas.

The clearing has not been maintained as it was during manned operation of the light station since at least 1957 and is presently being encroached upon by second growth forest and invasives. A fire perimeter does not exist between the building cluster and the forest and thus presents safety issues that should be immediately addressed. The outer edge of the clearing, historically a clear demarcation with the surrounding forest, is not readily apparent to an untrained eye. The encroachment of second growth forest into the clearing, which was carefully maintained during the historic period to prohibit any vegetation that might obstruct the clear sweep of the light, represents a significant loss of historic integrity.

The forested portions of the island remain largely intact. The forest has encroached into the clearing, as noted above. It retains a considerable degree of integrity, although it is presumably somewhat denser than during the period of manned operation of the station as a result of the cessation of cutting for firewood and building timber.

The overall organization of the cultural landscape reflects historic patterns and contributes to the significance and integrity of the site. The organization of the landscape holds high integrity in aspects of location, setting, material, workmanship, and association (Figures 89-91). Integrity is low in design, as the clearing no longer reflects elements of form, plan, or space that were integral to the historic function of the station.



Figure 89. Aerial view to northeast, 1983 (Lakeshore archives).



Figure 90. Aerial view to east, ca. 1995. Note extent of the forests encroachment into the clearing compared with Figures 36 and 37 (Lakeshore archives).





Figure 91. Aerial view to east, 2002 (Lakeshore archives).

## Land Uses and Activities

Land use patterns at the Raspberry Island Light Station are historically related to activities associated with maritime navigation and the daily life of the island residents, including subsistence agriculture and recreation. Throughout the historical period the island and its natural resources were reserved for the lighthouse keepers and their families. Although the Keepers' logs include numerous references to public use, and visitors were welcomed to the island, the keepers also held the option to question and restrict public use of the island's resources.<sup>173</sup>

The level of development varied in intensity across the island. The primary features associated with historical land use are the lighthouse yard, historically defined by a fence and containing the station's buildings, and its surrounding clearing, an area totaling approximately six acres. As noted above, the yard served as the primary focus for activities associated with both work and daily life. It incorporated all the station's buildings, the vegetable and flower gardens, a lawn, and various items and spaces for recreation. The clearing's primary purpose was to provide a clear area for the sweep of the light; however some keepers seeded the area with forage crops and harvested native and exotic grasses for livestock feed. The forest provided timber, firewood, berries, and other resources, but was subject to the least intensive development.

These land use patterns were maintained throughout the period of manned operation of the lighthouse, and were marginally expanded to meet individual tastes and needs. For example, the

---

<sup>173</sup> Raspberry Island Keeper's Log, July 10, 1886, September 14, 1890, July 17, 1907, May 20, 1910, September 6, 1910.

size and number of gardens expanded to accommodate not only the needs of island residents, but at one time included garden space for a keeper from a neighboring island.<sup>174</sup>

Relatively early in the development of the station, keepers enclosed the lighthouse yard with a fence. The area inside the fence developed a distinctive appearance, with flowerbeds, vegetable gardens, and a large expanse of lawn. Referred to by keepers as the "station grounds" or "station yard," the area inside the fence sometimes had a manicured appearance that mimicked the appearance of residential yards, at other periods the yard was less neat and tidy in appearance. Mention of garden plots date to 1897, though due to the minimal annual supplies delivered to the island gardens likely existed as early as 1863.<sup>175</sup>

Although the exact configuration of the fence and the materials used in its construction changed over the years, from the early 1890s until the cessation of manned operations in 1947 the lighthouse yard was separated from the remainder of the clearing. Beyond the yard the clearing was kept free of brush and trees that could affect the function of the light. The resulting lesser intensity of maintenance and manipulation lent the clearing a wilder appearance than the yard.

The physical complexity of the site grew with the addition of various buildings and trails into the woods. These additions occurred within the framework of the historic land use patterns and functions, and these broad patterns remain evident in the landscape today.

Current land use includes the continued function of a navigation beacon, as well as interpretation, maintenance, and administration conducted by the NPS. The public uses the entire island for recreational purposes.

The principal landscape feature associated with the historical use of the site, the light station clearing, has low integrity in feeling, materials, and design. Secondary forest has encroached to the edge of the lighthouse yard, which is no longer bounded by a fence, as it was during the entire period of interpretation (1902-1947). In contrast to the clearing, the lighthouse yard, which includes the historic building cluster, retains a high level of integrity in regard to land use in terms of location, feeling, and association relative to the period of significance.

## Circulation Networks

### Points of Access

The primary historical access and circulation systems were established early in the history of the Raspberry Island Light Station. Both island access points, at the sand point and at the dock below the lighthouse, were established by 1868. Soon after its completion, the preference for the dock below the lighthouse led to abandonment of formal improvements at the sand point, and the relative importance of the two landings changed. After 1868 there is little indication that the Lighthouse Board authorized funding for improvements at the sand point. Rather, the boathouse and dock below the lighthouse were rebuilt and repaired repeatedly during the historical period in response to the damaging effects of storms and ice. The present station dock is a modern

---

<sup>174</sup> Raspberry Island Keeper's Log, May 24, 1917.

<sup>175</sup> Keeper's Log abstracts, July 9, 1879.

structure, constructed by the NPS, but closely replicates the construction methods, materials, and configuration of the later period historic dock apparent in photographs from the 1930s and 1940s. While not a historic resource, it is valuable for interpretation of the station and continues to function in a historic use.

At the sand point evidence of historic period improvements are no longer visible. Nevertheless, the ease of access and the sheltered nature of the site remain clearly evident, as witnessed by its continued use by both NPS and private boats.

## Trails

The 'roads' on the island mentioned in the Keepers' logs were essentially footpaths or trails. The most important of these was the sand point trail, which linked the landing at the sand point with the station clearing. This trail dates to the earliest period of station development. The trail was improved with a bridge and a trestle over a ravine in 1935.<sup>176</sup> A popular hiking trail, it continues to convey the feeling and spatial associations of the island's past. It remains in its approximate historical alignment and, though improved with design elements such as bridges and water bars by the NPS, it retains a high degree of its historical integrity.

The trail developed in 1921 to monitor the Sand Island light has been partially reconstructed by the NPS. Its location approximates the historic path, though the precise historic alignment is unknown. Various trails, built into the woods by station residents to recover firewood and timber, were temporary in nature and have largely been reclaimed by the forest (Figure 92). The island's trails as well as the Sand Island overlook point do not meet National Register eligibility criteria.

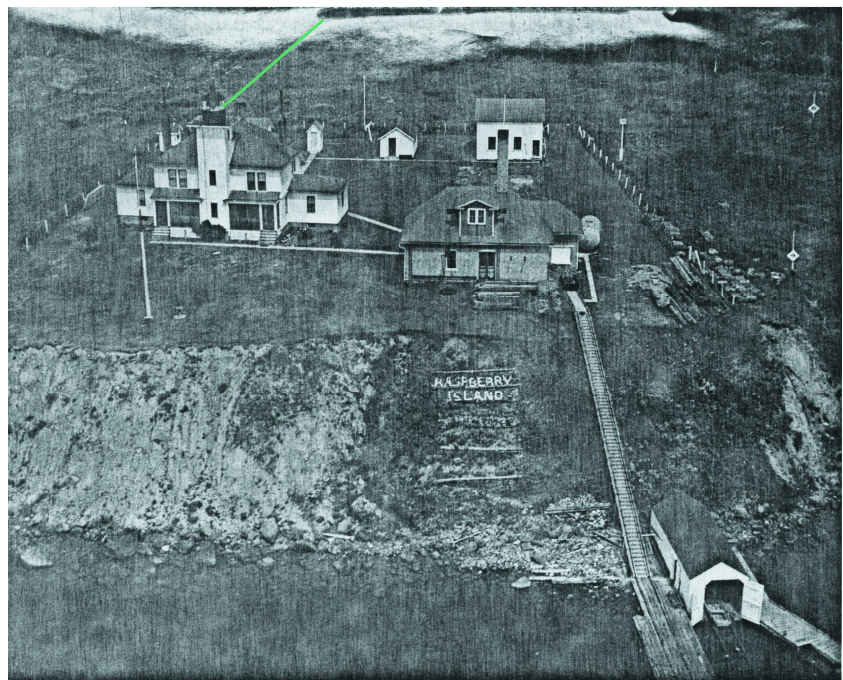


Figure 92. Aerial view ca. 1940. Note faint trail leading into woods at upper edge of photograph (Lakeshore archives).

---

<sup>176</sup> Raspberry Island Keeper's Log, November 18 to 26, 1935.



### **Pedestrian Paths: Concrete (#08104A, LCS 101630), Plank and Cinder Walkways**

The system of pedestrian paths that link the station dock with the yard and connect the buildings within the yard dates from the station's initial period of development. Historically, these paths were upgraded and improved through substitution of more permanent materials. The earliest connection between the dock and the lighthouse yard consisted of a set of wood stairs, replaced by a wood, and finally a concrete tramway. This feature is discussed below under buildings and structures.

Once atop the bluff, a series of "plank ways," which were laid down each spring and taken up at the end of the season, linked the various buildings. Plank walks are known to have connected shed #2 to the assistant keepers' privy, extended alongside the clothesline, and the west face of the barn. Gradually, the plank walks were replaced with more permanent concrete walks, with the majority of this work completed by ca. 1906. Remnants of the plank walks remain in front of the assistant keepers' privy and in front of the entry to the barn. These resources are addressed in detail under the discussion of archaeological resources.

Many of the concrete paths presently extant within the yard date from the 1906 reconstruction of the lighthouse. The system of paths was reconfigured at this date in order to provide access to the new building entries.

Historic paths or walks that are no longer extant include a concrete walkway that connected the shed #1 and the barn, which appears to have been removed after the 1940s, and a cinder path that extended from the fog signal building to the barn along the south side of the lawn (Figure 93; see also Figure 24).

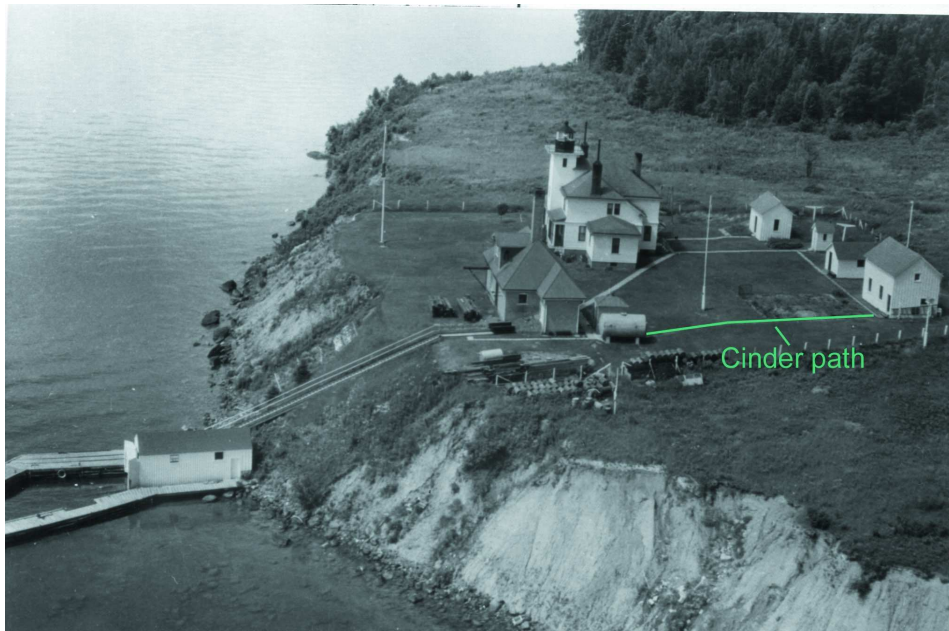


Figure 93. Cinder path location, ca. 1940. Also note walkway between shed #1 and barn (Lakeshore archives).

## Summary

The circulation system of Raspberry Island remains largely intact. The two historic access points and trails receive continued use. The circulation features extant in the lighthouse yard represent improvements built between roughly 1906 and 1932. These features retain high integrity, although lack of maintenance has affected some elements of the system. Grass has been allowed to grow over the sides of the concrete sidewalks and between the segments of the walks. This obscures the width of the walkways and contributes to their deterioration. Overall the circulation systems of the island retain high integrity in aspects of location, design, and setting. Elements of workmanship, feeling, and association are also retained. Although the loss of historic plank walk ways and the cinder path somewhat diminishes the integrity of the pathway system within the lighthouse yard, in total the island's circulation system may be considered a contributing element within the cultural landscape.

## Buildings and Structures

Most of the extant historic buildings and structures at Raspberry Island Light Station date from the period 1902 to 1906, early in the station's second period of development. Many of these resources have been altered, to a greater or lesser extent, since their original construction.<sup>177</sup> The majority of the buildings may be described as utilitarian in style, with simple vernacular details. The architectural embellishments reflect architectural styles popular at the time of construction. Most buildings are of wood frame construction, with clapboard or board and batten siding. The latter type of siding is limited to outbuildings, such as the shed and the barn. The fog signal building and the oil building are brick constructions from standardized Lighthouse Service plans.

The lighthouse and the fog signal building are the most significant buildings in terms of conveying an understanding of the work of the station. The remainder of the historic buildings served as support facilities for these two primary buildings, or reflect the domestic and "off-duty" needs of the island residents. Some small support buildings known to have existed, including a pole horse stable, chicken coop, and smoke house are no longer extant. Historic documents do not permit establishment of the precise location of these non-extant buildings. Archaeological investigations might locate evidence of these buildings although their relatively impermanent nature may not have produced archaeological remains.

### Station Lighthouse and Keeper's Quarters (#08103A, LCS 006390)

Originally constructed in 1862, this building was extensively enlarged and remodeled in 1906. The building is two stories in height with a square light tower centered on the front (west) façade. It has a brick foundation, clapboard wood siding, and hipped roofs covered with embossed metal shingles. The lighthouse retains a high degree of integrity in location, design, setting, workmanship, feeling, and association (Figure 94; see also Figure 54). The interior of the building has experienced some loss of integrity due to 1960s additions of linoleum, wall

---

<sup>177</sup> Dates of construction for some buildings are poorly documented other than by reference in the Keeper's logs and their appearance in dated photographs.



paneling, and ceiling tiles in some areas. The lighthouse is considered a contributing element of the cultural landscape.



Figure 94. Lighthouse and fog signal building ca. 1920. View to southeast. Note height and character of lawn (Lakeshore archives).

### **Fog Signal Building (#08102B, LCS 006392)**

Constructed in 1903 from standardized Lighthouse Service plans, the fog signal building is a single story brick building with a hipped metal roof. A gable roofed dormer on the west façade dates from the 1932 conversion of the fog signal from a steam whistle to an air-powered diaphone. The I-beam reinforcements visible on the west façade date from 1925. The historic chimney was removed after 1944. The alterations



Figure 95. View to southeast of fog signal building, 2003.

experienced by this building all occurred during the period of significance and do not detract from the building's integrity (Figure 95). The fog signal building retains high degree of integrity and is considered a contributing element of the cultural landscape.

### **Oil Building (#08102H, LCS 006375)**

Constructed in 1901 as a storage building for the kerosene used in the lighthouse light, this building is based upon Lighthouse Service standardized plans of the period.<sup>178</sup> The building retains a high level of integrity and is a contributing element of the cultural landscape (see Figures 31 and 57).

### **Barn (#08102C, LCS 006393)**

The one and one-half story wood frame barn dates from ca. 1906. Used variously used as a barn, warehouse, shop building, and living quarters over the years, the building was converted to residential use in 1963. The barn retains a high degree of integrity in regard to location, design, setting, feeling, and association (Figure 96; see also Figures 17 and 58). Interior remodeling has affected aspects of workmanship and materials. The barn is considered a contributing element of the cultural landscape.



Figure 96. Contemporary view to southeast of building cluster (left to right: keeper's privy, shed #1, barn), from lighthouse tower, 2003. Compare to Figure 17. Note clothesline behind (east) of buildings, propane tank in clearing east of barn, reconstructed birdhouse south of barn, vegetable garden plot, and non-historic grape arbor west of vegetable garden.

---

<sup>178</sup> Quinn Evans Architects, *Historic Structures Report*, 34.

### **Shed #1 (#08102G, LCS 006374)**

This building is located between the barn and the keeper's privy. The building served a variety of functions over time. It appears to date from the station's first period of development and may have served as a shed during this period. It later served as a carpenter shop, washhouse/laundry, and as the second assistant keeper's quarters. Although the 1906 lighthouse was designed to provide living quarters for the second assistant, the shed was occasionally used for that purpose.

The building retains a high degree of integrity, with the exception of materials (see Figures 17 and 60). Non-historic materials associated with the 1960s renovations include non-historic rolled roofing and modern sliding window sash. Shed #1, designated as the assistant keeper's cabin in the draft NHL nomination, is considered a contributing element of the cultural landscape.

### **Keeper's Privy (#08102E, LCS 006395)**

Possibly constructed ca. 1862 as part of the initial period of development, the keeper's privy may be the oldest building at the station. Placed on a concrete foundation by the NPS ca. 1978, this building retains high integrity and is considered a contributing element of the cultural landscape (see Figures 17 and 60).

### **Shed #2 (#08102F, LCS 006396)**

Shed #2 appears to have been built in 1904 to replace an earlier woodshed.<sup>179</sup> The building retains a high degree of integrity, but is in need of maintenance to its board and batten exterior siding, which is being damaged by poor site drainage (see Figures 17 and 61). The shed is considered a contributing element of the cultural landscape.

### **Assistant Keepers' Privy (#08102D, LCS 006394)**

Probably constructed ca. 1906, the assistant keepers' privy retains high integrity with the exception of the application of non-historic rolled roofing (see Figure 62). It is considered a contributing element of the cultural landscape.

### **Water Tank & Solar Shower**

Constructed by the NPS ca. 1982, this building is located immediately behind (east) the barn and is not readily visible to the public. It provides water to the ranger residence located in the barn and provides shower facilities for the ranger assigned to the station during the summer. The building is designed to reflect the historic architectural forms of the station buildings and, while non-historic, is not visually intrusive (see Figure 63). The building is considered a non-contributing element within the cultural landscape.

### **Boathouse (#08102K, LCS 101623)**

The present boathouse appears to represent a major 1940s reconstruction of an earlier structure. Significant portions of the walls and foundation are identified as belonging to older versions of

---

<sup>179</sup> Raspberry Island Keeper's Log, December 2, 1904.

the structure.<sup>180</sup> It retains a high degree of integrity and is considered a contributing element of the cultural landscape (Figure 97; also see Figure 64).



Figure 97. Dock and boathouse. View to southwest, 1936 (Lakeshore archives).

### **Dock (#08102A, LCS 006391)**

The station dock is a non-historic structure constructed by the NPS ca. 1978. However, this structure resembles historic period docks in terms of construction methods (crib construction) and general configuration (see Figures 43 and 65). While non-historic, and therefore a non-contributing element within the cultural landscape, the dock is essential for site access and important for interpretation of the station.

### **Steps and Tramway (#08104B, LCS 101624)**

In 1902, in anticipation of construction of the fog signal building, the Lighthouse Board ordered construction of a wood tram and hoist to ease the movement of construction materials from the dock to the top of the bluff. The existing concrete stairs and tramway date from 1932 (see Figures 36 and 66). The tramway and steps continue to be used to move people and material between the dock and the top of the bluff. This structure retains a high degree of integrity and is considered a contributing element within the cultural landscape.

### **Summary**

The extant historic period buildings and structures retain high integrity of location, design, setting, workmanship, feeling and association. Five buildings (the lighthouse, barn, sheds #1 and 2, and assistant keepers' privy) have experienced some loss of integrity in terms of historic materials. The lighthouse and barn interiors have been remodeled to include modern living quarters, while shed #1 and keeper's privy have non-historic roofing material. Shed #2 exterior siding is deteriorating as a result of moisture damage. Despite these minor losses of integrity, in

---

<sup>180</sup> U.S. Coast Guard, "Raspberry Island Light Station – Boat House As-Built" (28 October 1943). Architectural drawing on file at the park library.

general the buildings and structures at the station retain an exceptionally high degree of integrity and are integral components of the cultural landscape.

## Vegetation

### Gardens and Plantings

Flower and vegetable gardening was an important pastime for Raspberry Island residents throughout most of the historical period. Vegetable gardening was a necessity, as the Lighthouse Service only allotted and delivered supplies once each year. The degree of elaboration for both types of gardens appears to have depended upon the tastes of the individual keepers. In addition, the location and size of the gardens changed over time.

The majority of the extant gardens are reconstructions, created by the NPS in the early 1980s. These reconstructed gardens include the nine cobble-bordered flowerbeds in the lighthouse yard, the two linear beds west of the lighthouse, the foundation plantings along the south and east facades of the lighthouse, the two hosta beds northwest of the lighthouse, and the vegetable garden.

Gardens that were not reconstructed in the 1980s, and which appear to be historic in terms of their location and size, include the circular bed north of the swing, the day lily bed south of the shed, and the tiger lily bed between the steps on the west side of the lighthouse.

The size and location of the reconstructed cobbled gardens was based upon oral history testimony and review of historic photographs and closely approximates the 1920s Lee Benton era cobbled beds, though the spatial relationship between the flower beds and the vegetable gardens has been extended by several feet. The size of the vegetable garden is also somewhat conjectural, since the size of the historic garden plot cannot be accurately determined from historical photographs. The reconstructed gardens are non-historic features, do not meet National Register eligibility criteria, and are not considered contributing elements within the cultural landscape. Nevertheless, they currently serve an important function in terms of site interpretation.

*NPS-28: Cultural Resource Management Guideline* (1998) establishes specific standards that must be met in order for reconstruction to be chosen as a treatment. There must be sufficient documentary or physical evidence to permit "accurate reconstruction with a minimal conjecture," and reconstruction must be considered "essential to public understanding of the cultural associations of a park. . . ." <sup>181</sup> *NPS 28* also requires a "thorough archaeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction." The reconstruction must not "simulate a damaged or ruined cultural landscape or constitute a general representation of a 'typical' landscape, e.g., kitchen garden, period garden, orchard, that never existed historically." <sup>182</sup>

---

<sup>181</sup> National Park Service, *NPS-28: Cultural Resource Management Guideline* (DC: National Park Service, 1998). [http://www.cr.nps.gov/history/online\\_books/nps28/28chap7.htm](http://www.cr.nps.gov/history/online_books/nps28/28chap7.htm), 102.

<sup>182</sup> *Ibid.*, 102.



It is difficult to evaluate the accuracy of the historic garden plan implemented at Raspberry Island in 1980s given the documentation currently available for this work. Based upon discussions with Kate Lidfors, who conducted the garden restoration, information regarding the methodology and decision-making process used to develop the 1982 garden plan appears incomplete. The Raspberry Island Garden Manual, which provides guidance for planting and maintaining the various small flower gardens scattered about the lighthouse yard, does not explain the decision-making process used for reestablishing the flowerbeds, how their size and location were determined, or how the composition of the various beds was decided upon. At a larger scale, there is no documentation of an analysis of "design intent," which should be part of a reconstruction project.

The Keepers' logs provide little detail concerning the location or configuration of agricultural or garden plots. Two log references mention new gardens. In 1902, the log notes a west garden, presumably located in front of the lighthouse, planted in potatoes. This garden is possibly the west plot that is represented in the 1910 light station map (Figure 98). Entries from 1904 indicate establishment of a new potato patch but no location is given.<sup>183</sup>

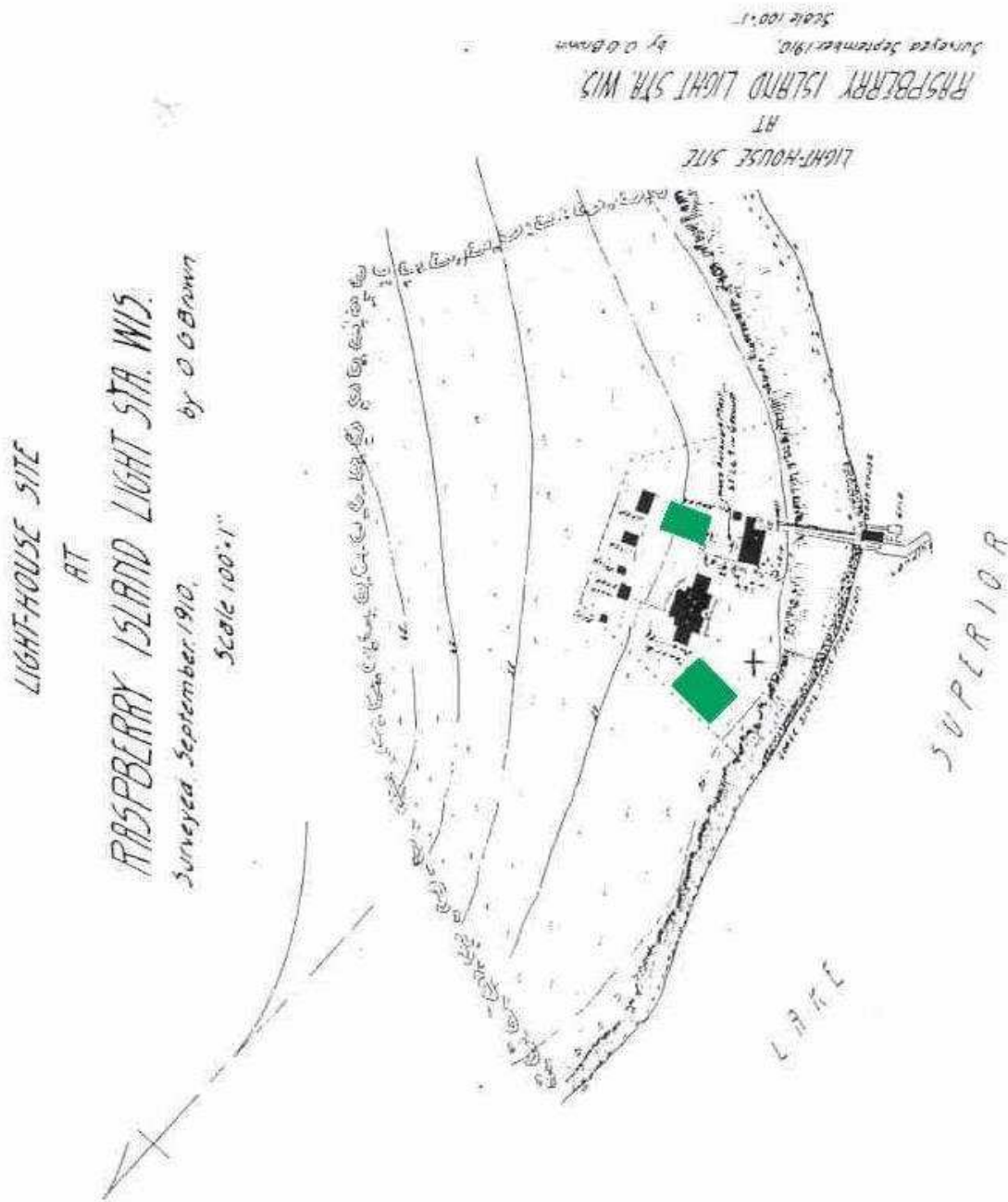
A garden plan exists in the park archive that is intended to reflect the ca. 1922 lighthouse yard landscape (Figure 99). However, this plan lacks a date of preparation, identified author, documented sources, or identification key. Further, the plan includes elements that clearly post date ca. 1922, such as the ca. 1930s fuel tank saddles flanking the oil building, and a yellow rose identified as possibly having been planted in 1963. The plan also indicates the yard fence in a configuration that did not exist historically.

The following evaluation of the station gardens is limited to available documentation and clarification of design intent; it does not include archeological investigation. The most useful documentation for the historic period vegetable gardens is the 1910 Light Station map (see Figure 98), which identifies the locations of two garden plots. One is located directly in front (west) of the barn, while the second, larger plot is located immediately northwest corner of the lighthouse and is oriented at an angle so that the north edge of the plot parallels the yard fence.

An aerial photograph from ca. 1940 definitively locates one historic garden, and indicates that one of the garden locations shown on the 1910 map continued to be used, at least on an intermittent basis, for several decades (Figure 100). Additional cultivated plots may have been located outside the yard fence, but there is no firm evidence to indicate their exact location without archeological investigation.

---

<sup>183</sup> Keeper's Logs Abstracts, May 8, 1902, October 29, 1904.



Map drawn in 1910 to accompany the "Detailed Description of Premises," written by the district inspector.

Figure 98. Historic garden locations as indicated on 1910 site map.

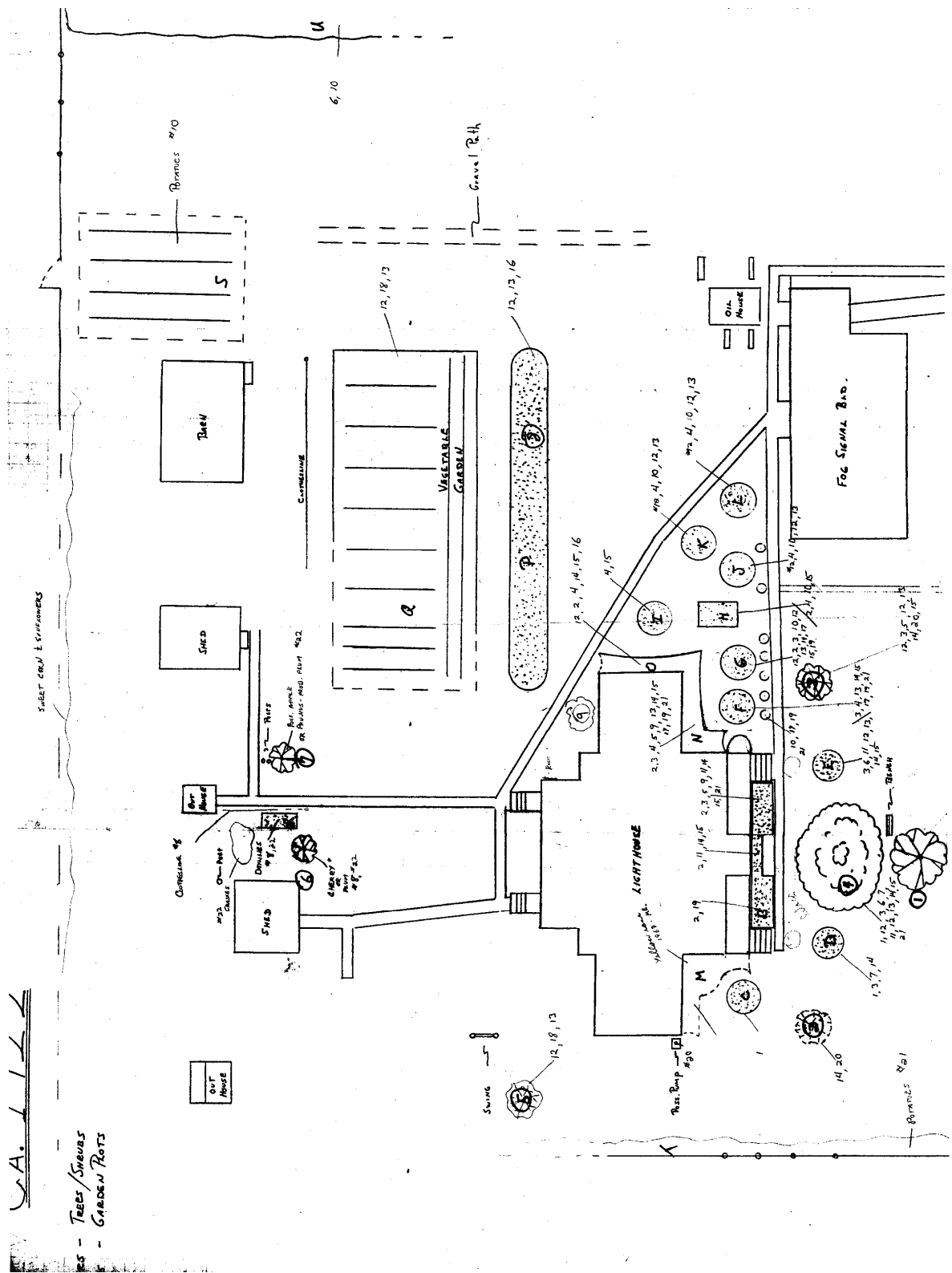


Figure 99. Garden Plan (date unknown) representing 1922 conditions (Lakeshore archives).



Figure 100. Historic location of vegetable garden, ca.1940 (Lakeshore archives).

Circa 1922 photography (see Figure 19) clearly indicates the location of an altogether different vegetable plot relative to the cobbled flowerbeds. This photograph however does not show the north or east boundaries of this plot and therefore cannot be used to determine the plot's size. A circa 1944 photograph indicates that this plot was, at least at that date, L-shaped in plan (see Figure 39). Photographs of the reconstructed garden plots indicate that the placement of the reconstructed garden plot, at least in terms of its relationship to the adjacent cobbled flowerbed is inaccurate (Figure 101). The spacing between the cobbled bed and the garden plot is several feet greater in the reconstruction than in the historic photograph. In addition, the east-west furrow orientation of the reconstructed plot does not reflect the historic north/south alignment visible in photographs. The north-south orientation would have permitted the sun to warm the soil between the row crops faster than the east-west orientation.



Figure 101. View to south of gardens, ca. 1980s. Compare spacing between plots with Figure 102. Note east-west furrows in vegetable garden and flag pole supports (Lakeshore archives).

Certainly vegetable patches existed in the yard during the historic period. The plot mapped in front of the barn in 1910 and visible in 1930 photographs appears to be the most long-lived vegetable plot during the period of interpretation. Keepers' logs reference some of the species grown in the gardens, but it is not known whether the logs mention every species grown in the

gardens (Table 2). It can be assumed that historic plants were heirloom varieties and not hybrids, based on the period in which they were planted. The garden plant community, currently tended by volunteers and park staff, rotates and changes seasonally.

Table 2. Vegetable Garden Crops from Period of Significance.

Vegetables	ID from Photo	ID from Keeper's log	Year first recorded
Onion ( <i>Allium cepa</i> )		X	1882
Lettuce ( <i>Lactuca sativa</i> )		X	1886-1890
Cucumber ( <i>Citrullus sativa</i> )		X	1886-1890
Bean (Unidentified type)		X	1886-1890
Squash ( <i>Cucurbitae</i> )		X	1886-1890
Pea ( <i>Pisum sativum</i> )		X	1886-1890
Rutabaga ( <i>Brassica napus</i> )		X	1886-1890
Pumpkin ( <i>Cucurbita pepo</i> )	X	X	1886-1890
Asparagus ( <i>Asparagus officinalis</i> )	X		Ca. 1920s
Tomato ( <i>Solanum lycopersicum</i> )		X	1896-1905
Cabbage ( <i>Brassica oleracea</i> )		X	1896-1905
Potato ( <i>Solanum tuberosum</i> )		X	1902
Beet ( <i>Beta vulgaris</i> )		X	1896-1905

The location and size of the reconstructed cobble-bordered flowerbeds in the lawn were based upon photographs dating from the period of Lee Benton's tenure as Keeper (1914-1924). Benton and his wife apparently built these small flowerbeds and filled them with hardy perennials and annuals (see Figures 24, 27, and 28). Oral accounts collected by Lidfors indicate the beds were possibly built up 6-8 inches.<sup>184</sup> The location and size of the beds appears reasonably accurate, though it probably does not meet current NPS standards for reconstruction, as outlined in *DO-NPS-28* (Figure 102). The planting material currently placed in these beds closely correlates with historic photos and logbook entries, though species with no historical documentation have been intermingled (Table 3).

<sup>184</sup> Droucher interview by Kate Lidfors, August 19, 1980.





Figure 102. Cobbled beds, ca 1982 reconstruction (Lakeshore archives).

Table 3. Historic Ornamental Vegetation – Raspberry Island Light Station.

Historic Ornamental Vegetation	ID from Photo	ID from Keeper s Log	Date First Recorded	Currently Present
Tiger Lily ( <i>Lilium columbianum</i> )	X			X
Pansy ( <i>Viola sp.</i> )		X	1882	X
Dianthus ( <i>Dianthus sp.</i> )		X	1882	X
Mountain Ash ( <i>Sorbus americana</i> )	X	X		X
Lilac ( <i>Syringa</i> )	X	X	1886-1890	X
Iris ( <i>Iris sp.</i> )	X			X
Astilbe ( <i>Astilbe sp.</i> )	X			
Nasturtium ( <i>Tropaeolum majus</i> )	X		1887	X
Dahlia ( <i>Dahlia sp.</i> )	X	X	1887	X
Day Lily ( <i>Hemerocallis sp.</i> )	X			X
Peony ( <i>Paeonia officinalis sp.</i> )		X	1887	X
Zinnia ( <i>Zinnia sp.</i> )		X	1887	X
Petunia ( <i>Petunia sp.</i> )		X	1887	X
Rose ( <i>Rosa sp.</i> )	X	X	1900	X

Other period photographs have permitted accurate identification of the historic contents of some beds. Tiger lilies (*Lilium columbianum*) were part of the foundation plantings on the west side of the lighthouse (Figure 103). The long cobbled bed, centrally located in the yard south of the lighthouse, once included iris (*Iris* sp.) and was anchored on either end by roses (*Rosa* sp.) (Figure 104). Astilbe (*Astilbe* sp.), nasturtium (*Tropaeolum* sp.) and dahlias (*Dahlia* sp.) occupied the circular beds and foundation plantings near the southwest corner of the lighthouse (see Figure 28). Day lilies (*Hermerocallis* sp.) can be identified in the circular bed near the privies. The Keepers' logs include references to tiger lilies and mention is also made of transplanting roses from Bear Island. Also mentioned in passing throughout the log are: Dianthus, currently present in the form of Sweet William (*Dianthus barbatus*), Peony (*Paeonia officinalis*), Zinnia (*Zinnia* sp.), Pansy (*Viola* sp.), and Petunia (*Petunia* sp.).



Figure 103. Daylilies in foundation beds at west side of lighthouse (Lakeshore archives).



Figure 104. Garden beds south of lighthouse, ca. 1922. Iris are located at the center of the bed. Shrubs – roses, currents or gooseberries – anchor either end of the long flowerbed (Lakeshore archives).

Non-historic ornamental vegetation currently present at the site includes Chamomile (*Anthemis tinctoria*), Clove (*Syzgium aromaticum*), Columbine (*Aquilegia*), Gaillardia (*Gaillardia pulchella*), Hosta (*Hosta sieboldiana*), Lupine (*Lupinus*), Marigold (*Calendula officinalis*), Phlox (*Phlox*), Rudbeckia (*Echinacea*), Shasta Daisy (*Leucanthemum*), Snap Dragon (*Antirrhinum*), Sweet Alyssum (*Lobularia*), Sweet Pea (*Lathyrus*). Two of these species, Gaillardia and Chamomile, have escaped the beds and colonized on the bluff in front (west) of the lighthouse. Recent stabilization of the bluff may help in the control of these two invasives.

The logs record the planting of ornamental trees, including mountain ash (*Sorbus americana*) and spruce (*Picea* sp.), and shrubs such as lilac (*Syringa* sp.). The lilac was reported to have been a white variety with the scent of saffron. The mountain ash and the lilac located directly west of the lighthouse were replanted as part of the reconstruction and their placement can be verified in historic photos (Figure 105). The lilac, however, is of the purple variety and does not match the historic white saffron-scented planting. In addition, historic records suggest that the lilac could have been part of a hedge of lilacs. One of the mountain ash at the northwest corner of the lighthouse is severely damaged. The tree has lost a major branch, resulting in half the attached tree lying across the front lawn (Figures 106-107). This tree placement cannot be verified through historic photos and should be removed.



Figure 105. View to northeast showing front yard of lighthouse ca. 1920s showing mountain ash and lilac. Note white blossoms on lilac and dimensions that suggest a hedge of lilac. Bedding plantings are visible at the northwest corner of the lighthouse. Wood post and wire fence is visible along north edge of lighthouse yard (Lakeshore archives). Compare with Figure 11, which shows the beginnings of a hedge planted ca 1900.

Most of the garden plots and flowerbeds extant within the lighthouse yard are reconstructions dating from the early 1980s. Placement and dimensions of cobbled beds appear accurate; however, the extant plantings do not coincide with plantings that can be identified through historic records and photographs. While efforts were made to assure the accuracy of these reconstructions, the garden plots and flower beds do not meet current NPS standards for reconstructions and must be considered non-contributing elements within the cultural landscape.

### Lawn

A lawn existed in the lighthouse yard as early as 1894. It appears to have been confined to the fenced lighthouse yard and is depicted as considerably more unkempt than at present in historic photographs (see Figures 11 and 94).

In addition to appearing more manicured than during the historic period, the present lawn extends farther to the south than the historic lawn, intruding into an area historically considered part of the station clearing (see Figure 44). Despite the discrepancies between the current and historic appearance of the station lawn, this feature is considered a contributing element within the cultural landscape.



Figure 106. Injured mountain ash (*Sorbus*). View to north, 2003.



Figure 107. Damaged mountain ash (*Sorbus*). View to west 2002.

## Edible Perennials

Edible perennials were abundant on the island and the keepers made regular use of this resource. Keepers' logs indicate that sometimes outsiders were excluded from harvesting, while on other occasions visitors were permitted to partake in the bounty. Perennials available from the island landscape mentioned by the keepers include cranberries (*Vaccinium oxycoccos* and *V. macrocarpon*), strawberries (*Fragaria vesca* and *F. virginiana*), raspberries (*Rubus pubescens* and *R. strigosus*), currants (*Ribes* sp.), and gooseberries (*Ribes* sp.). Cherries, both sand cherries (*Prunus pumila*) and pin cherries (*Prunus pensylvanica*), were also harvested (Table 4). In addition to berries, mention is made of harvesting caraway (*Carum carvi*) seed growing wild on the island.

Table 4. Historic Edible Perennials Identified at Raspberry Island

Historic Edible Perennials	ID from Photo	ID from Keeper s Log	Presently Extant
Cranberry ( <i>Vaccinium oxycoccos</i> and <i>V. macrocarpon</i> )		X	X
Wild Strawberry/ Wood Strawberry ( <i>Fragaria vesca</i> and <i>F. virginiana</i> )		X	X
Raspberry ( <i>Rubus pubescens</i> and <i>R. strigosus</i> )		X	X
Currant ( <i>Ribes</i> sp.)		X	
Gooseberry ( <i>Ribes</i> sp.)		X	
Sand Cherry/ Pin Cherry ( <i>Prunus pumila</i> and <i>P. pensylvanica</i> )		X	X
Caraway ( <i>Carum carvi</i> )		X	

Patches of berries were tended around the island, and strawberries appear to have been cultivated in the clearing. Cultivated strawberries were introduced into the formal landscape in 1905. Perennials currently raised within the yard that are not mentioned in historical documents include grapes (*Vitis* sp.) and American highbush cranberry (*Viburnum trilobum*). Two edibles mentioned in the logs that appear to be currently absent from the island plant inventory are currants and gooseberries.

Several edibles currently grow on the island, outside the station clearing, that are not mentioned in the Keepers' logs. These include velvet-leaved blueberry (*Vaccinium myrtilloides*), low-bush blueberry (*Vaccinium angustifolium*), red elderberry (*Sambucus racemosa*), common blackberry (*Rubus allegheniensis*), smooth blackberry (*Rubus canadensis*), Thimbleberry (*Rubus parviflorus*), wild plum (*Prunus Americana*), American hazelnut (*Corylus Americana*), and beaked hazelnut (*Corylus cornuta*).



## Invasives

Japanese knotweed (*Polygonum cuspidatum*), located east of the lighthouse, is present in the park flora list as the main invasive requiring regular treatment with pesticide spray.

## Field Crops

Field crops were raised in the clearing from at least 1891 through 1932 and most likely earlier (Table 5). Species included timothy (*Phleum pratense*), which was grown as a market crop, oats (*Sativa* sp.), and barley (*Vulgaris* sp.).<sup>185</sup> Hay production occurred inside an enclosure in 1928, which suggests that the field was fenced (Figure 108).<sup>186</sup> Straw is also mentioned in the logs.<sup>187</sup> Straw, used for livestock bedding, is a by-product of grain crops such as oats or barley. Potatoes (*Solanum tuberosum*) are also identified in the logs as a cash crop produced on the island. These fields and crops are no longer extant in the landscape. The clearing, described in detail below, does contain exotic species, some introduced as forage crops.

Table 5. Historic Field Crops.

Historic Field Crops	ID from Photo	ID from Keeper's Log	Currently Extant	Currently Absent
Timothy ( <i>Phleum pratense</i> )		X	X	
Straw (Oat or Barley) ( <i>Sativa</i> sp. and <i>Vulgaris</i> sp.)		X		X
Potatoes ( <i>Solanum tuberosum</i> )		X		X



Figure 108. Hayride, ca. 1926. Note post and wire fence (Lakeshore archives).

<sup>185</sup> Keeper's Log, June 19, 1886; Bayfield Press, Vol. 7, No. 40.

<sup>186</sup> Keeper's Log June 29, 1928.

<sup>187</sup> Keeper's Log, August 16, 1891.

Although field size was never recorded, an estimate of the number of acres in production may be obtained by comparing Keeper Jacker's 1886 production of three tons of hay, with local average production figures of two tons per acre.<sup>188</sup> By this estimation, at least an acre and a half was under hay production in 1886. It is reasonable to suggest that the entire area of cultivation was closer to 2.5 to 3 acres (Figure 109) if other crops such as oats, barley, and possibly potatoes are included.



Figure 109. Dimensions of historic agriculture area of approximately 2.5 acres

## Clearing

The pre-settlement island forest covered the clearing to the edge of the bluff. The forest was cleared during the initial stages of development of the light station both to provide a space for the lighthouse and its support facilities and to provide an unobstructed arc for the sweep of the light. This resulted in increased exposure of clay soils to the sun and transformed habitat conditions, creating a dry to dry-mesic soil-moisture regime. The clearing is currently catalogued by the Wisconsin Department of Natural Resources as grasslands.

As noted previously, the primary purpose of the clearing was to provide an unobstructed arc for the lighthouse light. Any agricultural or recreational use of the clearing could not obscure the

---

<sup>188</sup> Jacker Diary, August 4, 1886; Bayfield Press, Vol. 7, No. 40, July 23, 1881.

light. During the historic period the clearing was a clearly delineated zone located between the island forest and the fenced lighthouse yard. The forest has encroached into the clearing, which has not been actively maintained since ca. 1957, obscuring the boundary between these two zones and significantly reducing the apparent size of the clearing. Removal of the lighthouse yard fence has also blurred the boundary between the yard and the clearing. The existing lawn extends into the historic clearing at the south end of the site.

The Keepers' logs provide information on the historic appearance and use of the clearing. As noted above, it was used for various periods to raise field crops. The level topography of the clearing minimized the problem of runoff. In addition, a low vegetative cover was historically maintained as a buffer between the forest and field. This area was allowed to grow to a slightly higher stature and would have required less frequent burning than the field (Figure 110). Fire was used as a management tool in the clearing. Burns were most often conducted in the spring, but Keepers' logs include one account of autumn burning. Burning was used to prepare the space for agricultural purposes. It suppressed tall woody growth, encouraged short stature herbaceous cover, and supplemented organic composition of the soil.

Although Raspberry Island was never logged commercially, for over eighty years station keepers cut wood for both domestic and industrial use (see Figure 12). The constant demand for wood helped keep the clearing free of trees. Periodically, the logs note 'roads' being cleared into the forest for wood harvest. These features have regenerated forest species at a natural pace and are no longer visible to the untrained eye. The degree to which woodcutting affected the character of the native forest is poorly understood. It is likely, however, that the areas in closest proximity to the light station clearing, being most accessible, were most disturbed. The use of the forest as a woodlot means the boundary between forest and clearing may have been fluid, especially across the east edge of the clearing (see Figure 84). This edge of the clearing was not defined by the arc of the light and offered the shortest distance for transporting harvested firewood. As a result, this boundary may have varied over time.

Although the clearing currently has low integrity and is in poor condition, it is a historic landscape element and contributes to the character of the cultural landscape (Figure 111). Implementation of the rehabilitation treatments described in Chapter 5 could improve the condition of the clearing and reestablish some of its integrity, thus enhancing its contribution to the cultural landscape (see Figure 90).

## Summary

Ornamental vegetation within the lighthouse yard was an important historical feature of the Raspberry Island Light Station. Similarly, vegetable gardens appear to have been a constant feature during most of the period of significance. The reconstructed flowerbeds and vegetable plots currently present at the light station do not meet current NPS documentation standards for reconstructions. Current vegetation within the clearing is intended to suggest the period 1915-1924; however, only the cobbled flowerbeds reflect this period. Neither the clearing nor the rest of the lighthouse yard are accurate depictions of the period. In some cases, such as the vegetable garden, the location, size, or content of plots is historically inaccurate, while the field crops that existed during the period are now absent. In general, the vegetation at Raspberry has low historic integrity in terms of its location, design, materials, workmanship, association, and feeling.

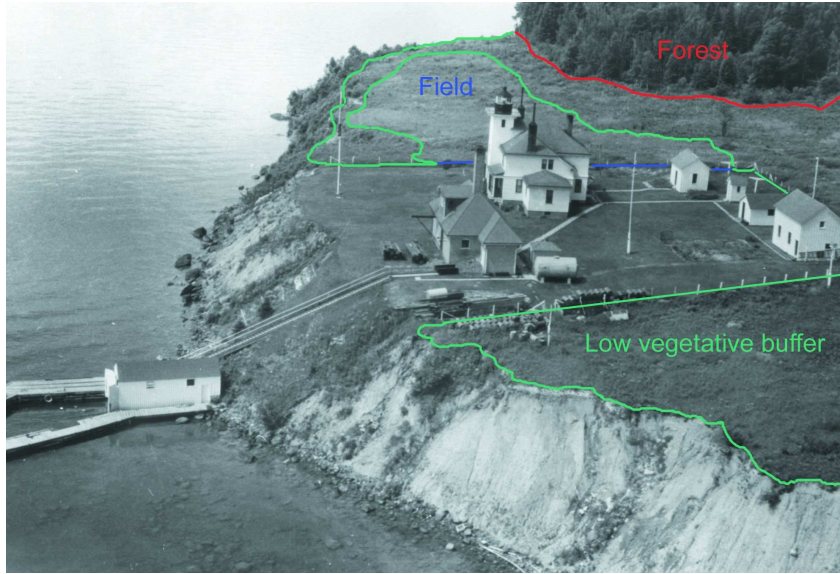


Figure 110. Aerial view, ca. 1940s showing vegetative buffer in clearing (Lakeshore archives).

## Small-Scale Features

All historic small-scale features at Raspberry Island Light Station are located within the light station clearing and lighthouse yard. Small-scale features include elements that provide detail and diversity, combined with function and aesthetics. They include items associated with the operation of the light station and the domestic life of the station's inhabitants. The draft NHL nomination addresses a number of these landscape elements as "structures," but they appear to more appropriately be considered "objects" as defined in NRHP guidance.<sup>189</sup> In any event, for the purposes of this CLR they are appropriately considered "small-scale features."

The extant small-scale features include historic elements, largely dating from the station's primary period of interpretation (1902-1947) and reconstructions erected by the NPS in the 1970s and 1980s. The location and appearance of the reconstructions are largely based upon photographic evidence from the period of interpretation.

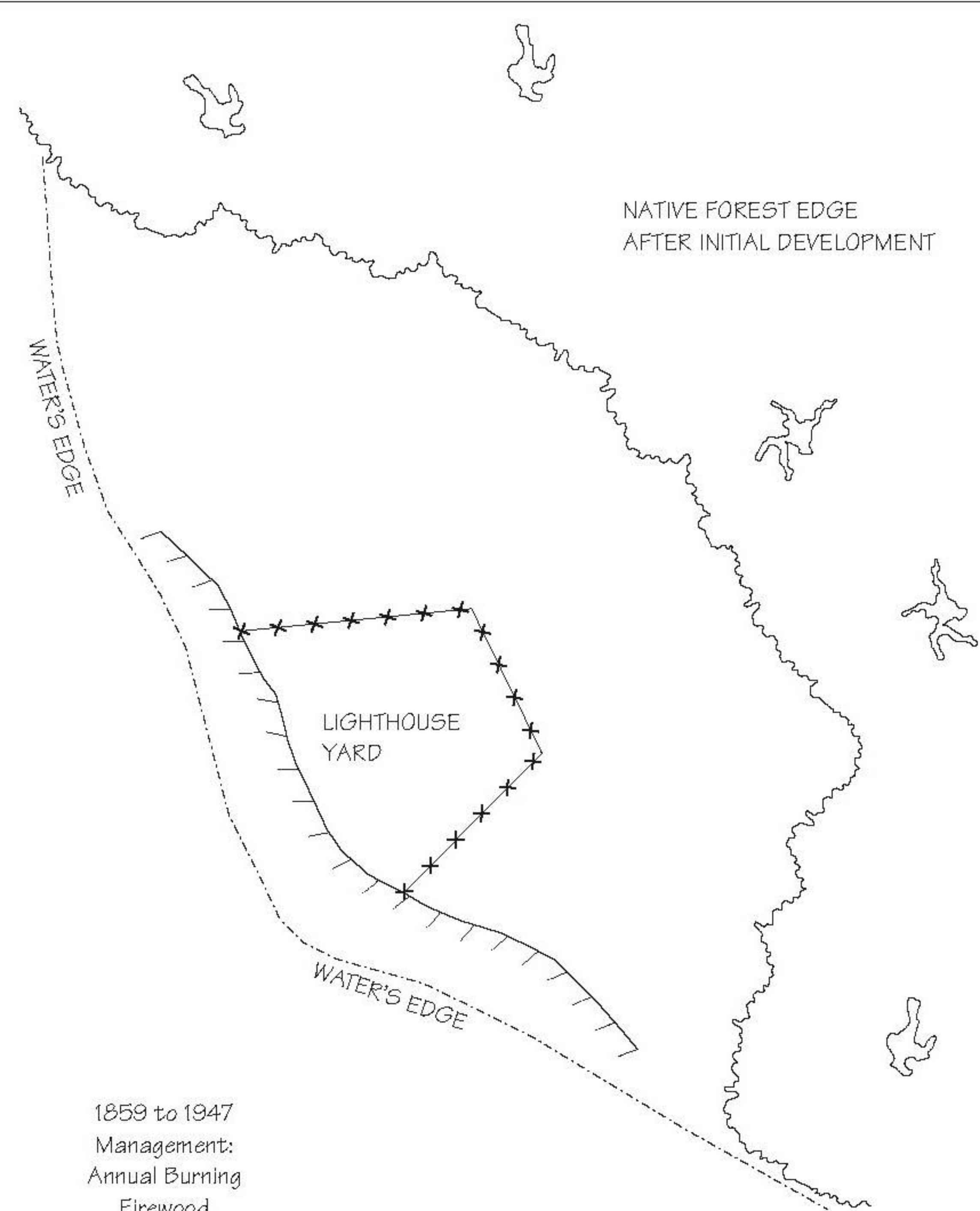
The significance and integrity of the extant small-scale features are described below in an order that approximates the order in which a visitor might encounter them after arriving at the Raspberry Island boathouse. The order of description basically moves from west to east within the lighthouse yard. Small-scale features located outside the yard, within the historic boundaries of the station clearing are discussed last.

<sup>189</sup> *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* defines object to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, moveable, an object is associated with a specific setting or environment (page 5). In contrast, the *Guide to Cultural Landscape Reports* uses the term small-scale features (page 146), and describes this type of construction as an element that provides detail and diversity for both functional needs and aesthetic concerns in the landscape. Examples of small-scale features include fences, benches, monuments, signs, and road markers.

INSERT 11x17 MAP

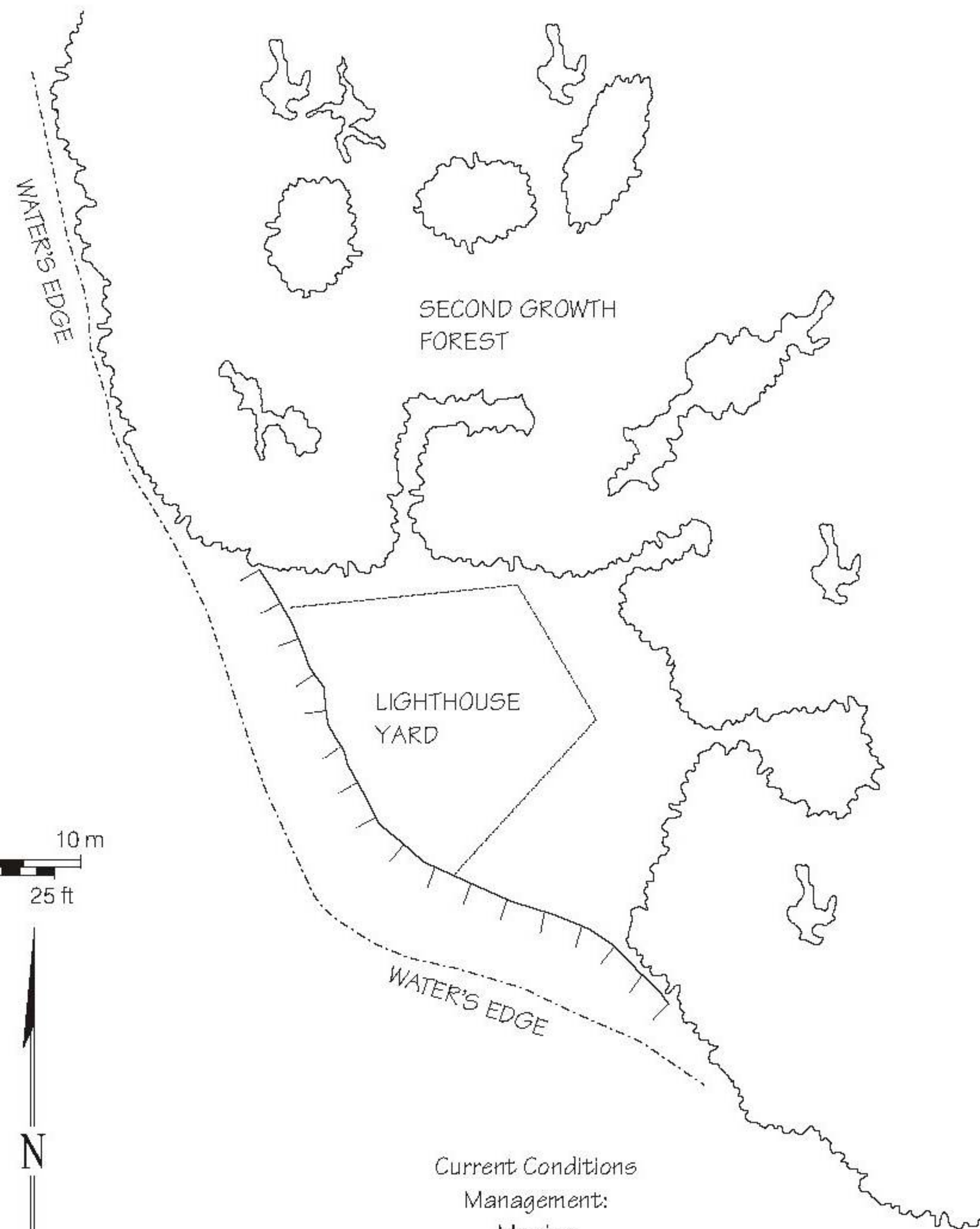
Figure 111. Canopy and cover.





1859 to 1947  
Management:  
Annual Burning  
Firewood  
Agriculture  
Livestock  
Mowing

0 10 m  
0 25 ft



Current Conditions  
Management:  
Mowing

### **Walks (#09104A, LCS 101630)**

Three types of walkways existed during the historic period: cinder, wood plank, and cement. Only the cement walkways installed ca.1906, and repaired on numerous occasions, remain extant (Figure 112; see Figure 75). Some of these walks form a continual path while others are arranged in a stepping stone manner. The cement walkways are historically accurate if not complete and help illustrate the daily patterns of circulation on the site. The walks are in fair condition, though grass has been allowed to cover the edges of the walks, visually reducing their apparent width. The cement walkways retain a high degree of integrity and are considered contributing elements within the landscape.



Figure 112. Historic view of cement walks, ca. 1920s (Lakeshore archives).

The fragmentary surviving portions of the wood plank walkways are analyzed and evaluated below under Archaeological Features. The cinder path, which extended from the southeast corner of the fog signal building to the entry to the barn, is no longer extant. The absence of these two elements somewhat hampers interpretation and understanding of circulation patterns within the lighthouse yard.

### **Light Beacon**

In 1957 the U.S. Coast Guard installed an automated light beacon located at the edge of the bluff, immediately west of the fog signal building. This feature postdates the period of significance and is considered a non-contributing element within the cultural landscape. Nevertheless, it is required for navigation, is included in site interpretation, and illustrates the technological evolution of navigation aids.

### **Cistern (#08104C, LCS 101628)**

The capped water cistern located in front (west) of the fog signal building dates to the 1903 construction of the building (see Figures 15 and 73). It provided water, siphoned from the lake, for the boilers that powered the steam fog whistle. It retains integrity of location, setting, workmanship, feeling and association. The cistern lacks integrity of design because of the removal of the historic period hand pump and water lines extending into the fog signal building. The feature has also been reduced in height. Nevertheless, the cistern retains a medium degree of

integrity and is considered a contributing element of the cultural landscape and contributes to the interpretation of changing technology at the station.

### **Flagstaff**

No flagstaff is currently present at the lightstation. An elaborate flagstaff, with a topmast and gaff, stood for many years in front (west) of the lighthouse near the edge of the bluff. Dates for the flagstaff's construction are unavailable, and bank erosion appears to have claimed the historic location of this feature, though the year of its disappearance is not documented (Figure 113). A modern wood



Figure 113. Historic flagstaff locations, ca. 1940 (Lakeshore archives).

flagstaff, presumably erected by the NPS, was dismantled prior to the bank stabilization project and is cached in the bushes northwest of the lighthouse. A secondary flagstaff once stood east of the fog signal building (see Figure 31). All that remains of this feature are the supporting posts, described below. The presence of a flagstaff is an important site feature that illustrates the formal federal authority that operated the station.

### **Birdbath**

A cobblestone birdbath, located west of the lighthouse and south of the primary flagstaff, is visible in a ca 1936 photograph and a 1940s aerial photograph (see Figures 35 and 36). The date of construction of this non-extant feature is unknown.

### **Concrete Oil Cradles (#08104E, LCS 101627)**

Two concrete oil cradles flank the oil building (see Figures 31 and 74). These cradles, likely built ca. 1932 in association with the conversion of the foghorn from steam to compressed air furnished by diesel -powered compressors, originally supported metal fuel tanks. The saddles retain a high degree of integrity in location, design, setting, workmanship, feeling, and association. However, the tanks that were once a part of this feature are no longer extant, thus this feature lacks integrity in materials. The oil cradles contribute to the interpretation of changing technology at the station and are considered contributing elements of the cultural landscape.

### **Drainage Trough**

A cement drainage trough, probably constructed ca. 1906, lies adjacent to a portion of cement walkway immediately east of the fog signal building (see Figure 75). This trough is the only



visible extant remnant of the historic drainage system. Keepers' logs refer to "sewers," which carried stormwater from the lighthouse yard to the edge of the bluff. The cement trough conveys the measures that lighthouse residents took to relieve the drainage problems associated with the yards clay soils and minimal slope. The trough is presently non-functional, with grass growing between the segments of concrete. Nevertheless it dates from the period of significance, retains medium integrity, and is considered a contributing element within the cultural landscape.

### Grape Arbor

The extant grape arbor, located along the west side of the reconstructed garden plot, is a non-historic feature dating from the NPS reconstruction of the station gardens in the 1980s (see Figure 114). There is no visual evidence that such a feature existed at the station during the period of significance. It is considered a non-contributing resource within the cultural landscape.

### Flagstaff Pole Supports

The pair of white wooden poles that supported the secondary flagstaff or aerial mast are located between the fog signal building and the reconstructed garden plot. These poles appear to date from the 1930s and are visible in many period photos (Figure 114; see also Figure 37). Historic photographs clearly show a flag flying from this staff, although it may also have served as a radio antenna mast after 1941.<sup>190</sup> This feature retains integrity of location and setting, but because of the absence of the flagstaff it has a low level of integrity of design, workmanship, feeling, and association. Nevertheless, the supports date from the period of significance and are considered contributing elements within the cultural landscape.



Figure 114. View to east of pole supports (left of barn), 2003. Compare to Figure 31.

---

<sup>190</sup> Snyder, *Historic Structures Report*, 124-127.

## Swing

A swing existed at the station from as early as 1900. The present swing is an NPS reconstruction, dating from ca. 1978, approximating the form and location of the historic swing. Historic photographs, however, indicate that the swing was perhaps twice as tall as the reconstructed feature (Figures 115-116; see also Figure 26). The existing swing is a non-historic reconstruction and is not considered a contributing element within the cultural landscape.

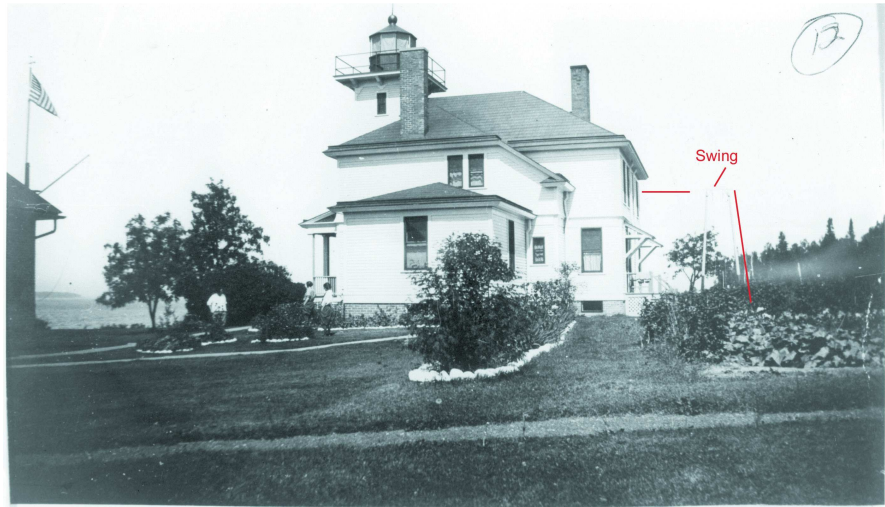


Figure 115. Historic view to north, ca. 1922. Note height of swing marked in red (Lakeshore archives).



Figure 116. View to northwest of yard, 2003. Note reconstructed swing (to left of barn) and compare height of feature with height in Figure 117.



## Clothesline

Clotheslines presumably existed at the station from an early date. In 1921, the Keeper's log describes the clothesline as located at the east end of the buildings.<sup>191</sup> Though the location of the clothesline has shifted over the years, the present clothesline appears to date from ca. 1939 and is visible in historic photographs. A plank walk was once associated with the clothesline. This walkway was removed in 1939.<sup>192</sup> The clothesline retains high integrity and is considered a contributing element within the cultural landscape (Figure 117).



Figure 117. Clothesline. View to north, 2003.

## Lighthouse Yard Fence

The boundary between the lighthouse yard and the clearing was demarcated with a fence as early as 1877. The original fence was a board or rail fence (see Figures 8 and 10). In the early twentieth century this feature was replaced with a post and wire fence (see Figure 108). The fence was repaired, rebuilt, and relocated on numerous occasions. Historic photographs from the 1930s provide information on the location of openings and gates within the fence line. One gate is sited on each of the three lengths of fence (Figures 118-119). There is no fence presently extant. This was an important landscape feature that is missing from the present built environment of the island.

---

<sup>191</sup> Keeper's Log, May 6, 1921.

<sup>192</sup> Keeper's Log, July 6, 1931, September 4, 1931, August 25, 1939.

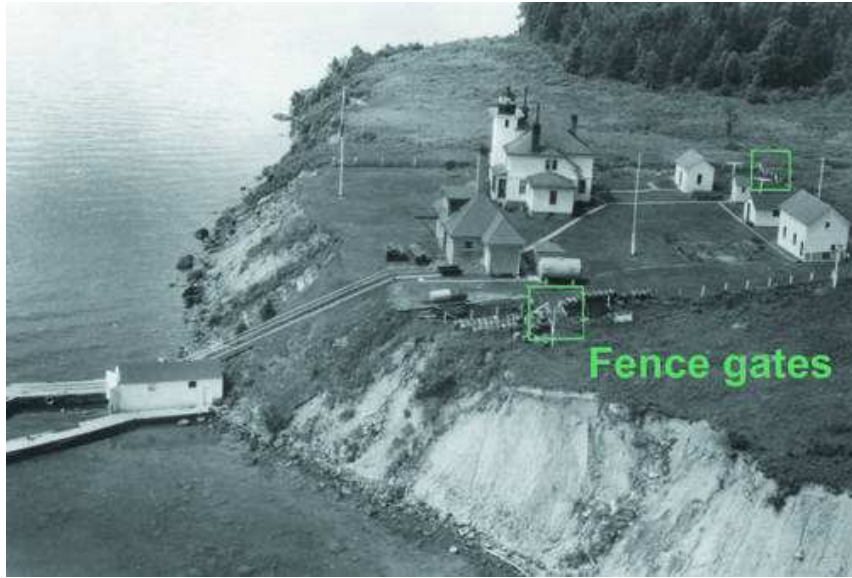


Figure 118. Detail of Figure 36, showing location of fence gates, ca. 1940 (Lakeshore archives).



Figure 119. Detail of Figure 36, showing location of fence gate, ca. 1940 (Lakeshore archives).

## Weather Station

The weather station, located within the historic clearing east of the barn (see Figure 79). Was installed by the Coast Guard after their assumption of management duties on the island. It is presently non-functional. The weather station is considered a non-contributing element within the landscape because of its late date of construction.

## Birdhouses

Birdhouses existed at several locations at the station date from at least 1931 (Figures 120-121). The present birdhouse, located south of the barn, approximate the form and location of one of these historic features, but was constructed by NPS during the 1970s (Figure 122). This non-historic feature is considered a non-contributing element within the cultural landscape.

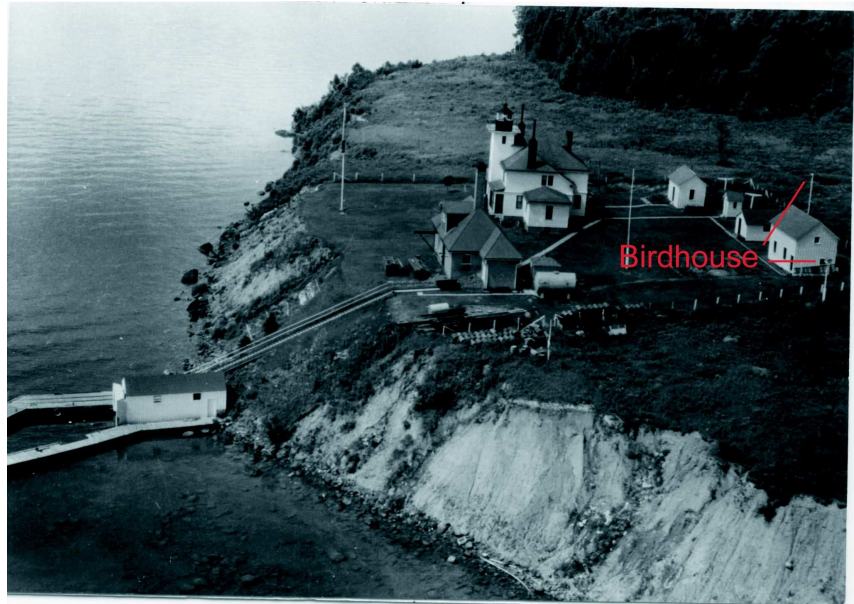


Figure 120. Birdhouse locations, ca. 1940 (Lakeshore archives).



Figure 121. Birdhouse location, ca. 1944 (Lakeshore archives).





Figure 122. Birdhouse in foreground to left of barn, 2003.

### **Range Marker**

The surviving range marker is one of a pair of navigation aids erected in the station clearing in the 1930s (see Figure 36). It is in poor condition and in need of stabilization. The marker, originally visible from the lake, is now located in the encroaching woods alongside the trail to the sand point. Although the marker's integrity is moderate, based on the loss of the other half of the pair and its lack of visibility, it could be enhanced by clearing encroaching vegetation and recreating the lost marker. It represents an important navigational tool, is important for interpretation and is considered a contributing element within the cultural landscape.

### **Interpretive Signage**

NPS interpretive signs, or wayside exhibits, are located at the south end of the present lighthouse yard in an area historically located within the station clearing (see Figure 44). The signs provide site interpretation, but do not contribute to the cultural landscape.

### **Picnic Tables**

The NPS placed these objects on the site for use by visitors. They are non-historic resources and are considered non-contributing elements of the cultural landscape.

### **Pit Toilets**

Two modern pit toilets are located near the southern edge of the clearing. These facilities were constructed by the NPS to accommodate island visitors. They are non-historic features and are considered non-contributing elements of the cultural landscape.

### **Summary**

The extant small-scale features that date from the station's period of significance retain sufficient integrity to be considered contributing elements within the cultural landscape (Figure 123). These remaining objects speak not only to the operation of the station as part of Lighthouse Service, but also to the Keepers' daily lives including routine domestic chores, children's

recreation, and individuals interests. Although the inventory of these features has diminished, they are representative of the range of objects formerly extant. They add richness to the site inventory and contribute to its historical significance and eligibility. Most are in fair condition and require maintenance and stabilization efforts.

Small-scale features that do not contribute to the historic landscape include the contemporary navigation beacon, pit toilets, and landscape features reconstructed by the NPS. Although the reconstructions augment site interpretation; because they do not meet current NPS standards, they are considered noncontributing. Significant non-extant small-scale features include the light station fence, the flagstaffs, and the birdbath. Their absence diminishes the level of landscape integrity. Table 6 lists all small-scale features identified for the Raspberry Island Light Station and indicates whether they contribute to the cultural landscape.

Table 6. Small-Scale Features at Raspberry Island

Resource	Integrity	Contributing	Non Contributing	Missing Elements
Walks	Yes	X		cinder path, wood plank walkways
Cistern	Yes	X		hand pump, water lines
Tank Saddles	Yes	X		fuel tanks
Drainage Trough	Yes	X		
Flagstaff Poles	Yes	X		flagstaff/mast
Range Marker	Yes	X		one missing
Clothesline	Yes	X		
Root House	No	X		
Plank walks	No	X		X
Lighthouse Yard Fence	No			X
Flagstaffs	No			X
Birdbath	No			X
Weather Station	No		X- remove	
Birdhouses	No		X- reconstruct	
Arbor	No		X- remove	
Swing	No		X- reconstruct	
Light Beacon	Yes		X - modern	
Interpretive Signs	No		X - modern	
Picnic Tables	No		X - modern	
Pit Toilets	No		X - modern	





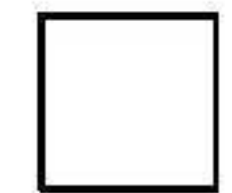
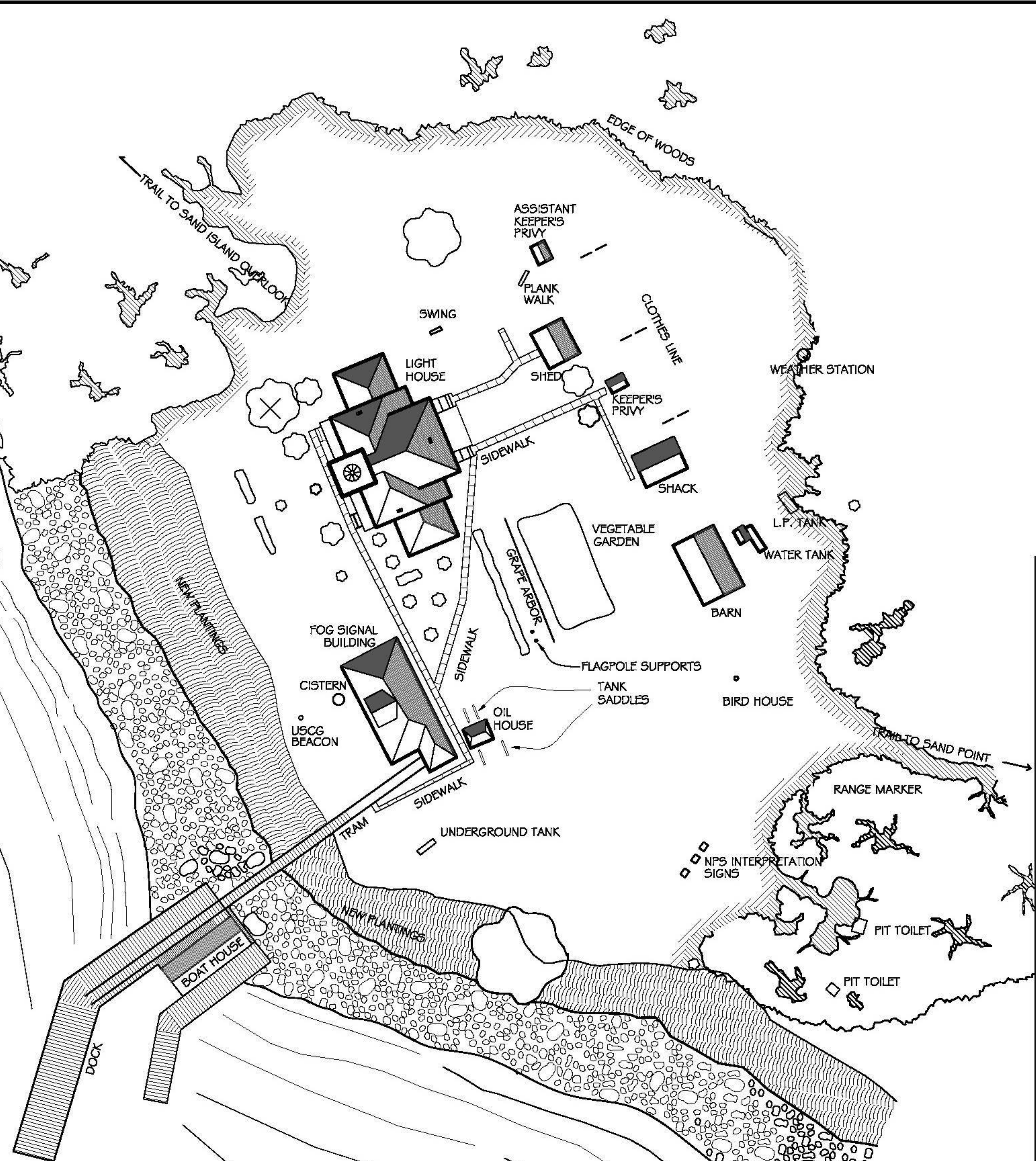
INSERT 11x17 MAP

Figure 123. Base map of existing conditions.

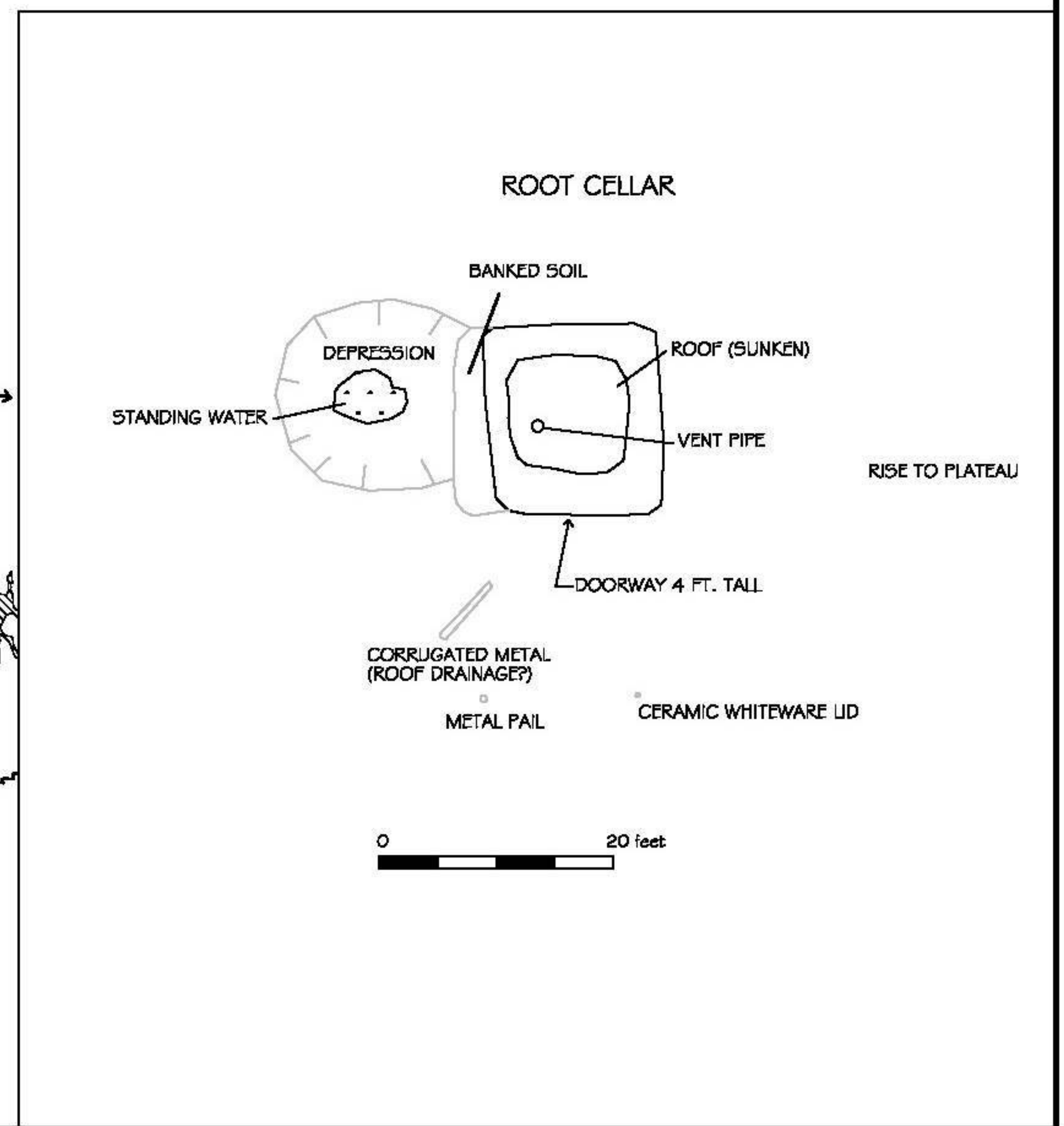


-Figure Created in AutoCAD 2000i for HRA/Gray & Pope Project 02-32012 - Draft of 5-13-2004

0 100 ft.



ROOT CELLAR  
(SEE INSET)





## Archaeological Features

Two archaeological features have been identified at Raspberry Island Light Station. The remains of a ca. 1935 root house are located in the clearing east of the lighthouse yard. This feature has not been fully investigated and its integrity is presently undetermined. Nevertheless, because the feature can be identified in the Keepers' logs and because it retains integrity of location it is considered a contributing resource within the landscape.

Remnants of the system of wood walkways that occupied the lighthouse yard are evident immediately in front (west) of the barn entry and extending southwest from the assistant keepers' privy (Figure 124; see also Figure 23). The extent of these resources is unknown, and their integrity as archaeological features is presently undetermined. Nevertheless, because they retain integrity of location they are considered contributing resources within the landscape.



Figure 124. Remnants of wood walkway to assistant keepers' privy. View to southwest, 2003.





## Part II

### Chapter 5: Treatment

#### Introduction

The treatment section of the CLR articulates a preservation strategy for long-term management of the Raspberry Island cultural landscape based upon that landscape's significance, existing conditions, and contemporary use. The preservation strategy is based upon the historical research, existing conditions, and analysis and evaluation documentation presented in Part I of the CLR.

Treatment of a cultural resource must be guided by the policies, guidelines, and standards contained in *NPS-28 Cultural Resource Management Guideline*, and *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. These documents identify four types of treatment: preservation, rehabilitation, restoration, and reconstruction. Specific policies, guidelines, and standards have been promulgated for each of the four treatment types. The four treatment types constitute the philosophical basis for responsible preservation practice and provide for the long-term preservation of a landscape's historic features, qualities, and materials.

#### Landscape Character

The key character-defining feature surviving from the historic period is the island's overall spatial organization, which was established early and maintained throughout the period of manned station operation. Although the boundaries between the lighthouse yard, station clearing, and remainder of the island have become obscured through forest regeneration within the historic boundaries of the clearing, they remain visually apparent. The heart of the lightstation, both historically and at present, was the lighthouse yard with its buildings, structures, formal circulation system, and landscape elements. The station clearing, an area whose integrity has been compromised by encroaching vegetation, permitted the navigation light to sweep in an unobstructed arc over more than 180 degrees. Other activities that occurred within the clearing were subservient to the need to preserve an unobstructed arc for the light. The remainder of the island offered a sand point for safe landing, an extensive wood lot, edible berry patches, and a supply of game, such as rabbit, geese and fish. These resources proved essential for the subsistence of the station's residents.

Landscape modifications made between 1862 and 1947 remain largely extant and retain a high level of integrity. In addition to overall landscape organization and land use, landscape resources that contribute to the site's significance and character include circulation features (primary accesses, trails, walkways and tram), vegetation (native and second growth forests, grasses, and ornamental and vegetable gardens), historic structures, including a variety of outbuildings, small-scale features (swing, range marker, and birdhouse), and archaeological resources (root house

and plank walks). Regardless of changes over time that have permitted new uses of the site, these key resources continue to contribute to the integrity of the island.

## Management Philosophy

Significant cultural landscape resources at Raspberry Island provide a range of options for management that conform to the Lakeshore's General Management Plan (1989). Although the NPS is currently developing a new General Management Plan, it is not finalized and was not available for use in developing this document. The character of the island's landscape features is directly associated with maritime practices of the early twentieth-century. Regenerating forest, tenant occupants, and NPS programmatic needs have all altered the landscape; however, key cultural landscape patterns, relationships, and individual features survive. Not all areas of the island hold the same level of significance or contain the same types of resources; therefore, different management approaches are necessary to address specific areas of the island.

The island is significant because of the high degree of integrity associated with its period of significance, as evidenced in historic land use patterns and overall landscape organization. Design treatments and management of the cultural landscape should focus on interpreting historic features from the period of significance as a means to enrich visitor understanding of the relationships between Raspberry Island, the other Apostle Islands, the mainland, and continuity of site use over nearly a century.

The degree of physical intervention required to maintain a cultural landscape differs between four treatment types, with the least intervention generally required for preservation, and the greatest level of intervention required for reconstruction. Preservation maintains a landscape in its existing state. Rehabilitation recommends some change to accommodate contemporary use. Restoration often entails removing later elements and reconstructing missing features in order to depict a landscape at a particular point in time. Reconstruction replicates a non-extant landscape through new construction. As the level of physical intervention increases, NPS policies, guidelines, and standards require an increased level of documentation and justification.

## Management Zones

Treatment recommendations for the Raspberry Island Lightstation landscape correspond with three management zones (Figure 125). Varying levels of historic development, significance, and integrity define the management zones.<sup>1</sup> Establishing the management zones within the cultural landscape will address the findings from the evaluation and assist management in setting priorities for long-term treatment. Only two zones have proposed treatment, the third zone will be classified and managed as wilderness. While the zones will guide management of specific

---

<sup>1</sup> Page et al., *Guide to Cultural Landscape Reports: Contents, Process, and Techniques*, (National Park Service: Washington, 1998), 75. Management zones define areas of a cultural landscape that have been assigned specific treatment objectives. They are defined by the type and degree of historical integrity within a landscape. Management zones are identified in collaboration with park management when there is a need to develop a range of treatments strategies for individual features or areas within a single property.

areas, it is important to recognize that the entire island is significant and that the Raspberry Light Station is listed in the National Register of Historic Places.

### **Zone I**

*Areas with a high degree of historical development, significance, and landscape integrity associated with the period of significance.*

The lighthouse yard: including buildings, structures, circulation systems, ornamental vegetation, and small-scale features.

### **Zone II**

*Areas with a high degree of significance, but compromised integrity due to the loss of cultural landscape features.*

The station clearing: integrity compromised by incursion of second growth forest, but a significant feature for interpretation.

### **Zone III**

*Natural areas with a high degree of significance associated with the historic era.*

Native forest: this area is currently included in the Apostle Islands Wilderness Study. The Lakeshore will manage it for wilderness values as described in the Wilderness Study and subsequent management plans.

## **Recommended Treatment**

The primary treatment recommended for the cultural landscape at Raspberry Island is rehabilitation, with targeted restoration of selected deteriorated or missing features.<sup>2</sup> The alternatives, with specific treatment recommendations focused on two of the zones.

### **Zone I: Lighthouse Yard**

The lighthouse yard, defined as the area historically fenced off from the rest of the island, is the zone with the highest degree of historical integrity and the greatest concentration of cultural resources. The yard encompassed the majority of domestic activity at the lighthouse and was the center of island life. It includes most of the historic buildings, structures, and small-scale features associated with the light station, as well as the island's ornamental plantings and vegetable gardens. This area was historically the most intensively developed part of the island landscape.

---

<sup>2</sup> *The Secretary of the Interior's Standards for the Treatment of Historic Properties* defines Rehabilitation as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values. Restoration is the process of accurately depicting the form, features, and character of a property as it appeared at a particular period in time by removing features from other periods of its history and reconstructing missing features from the restoration period.

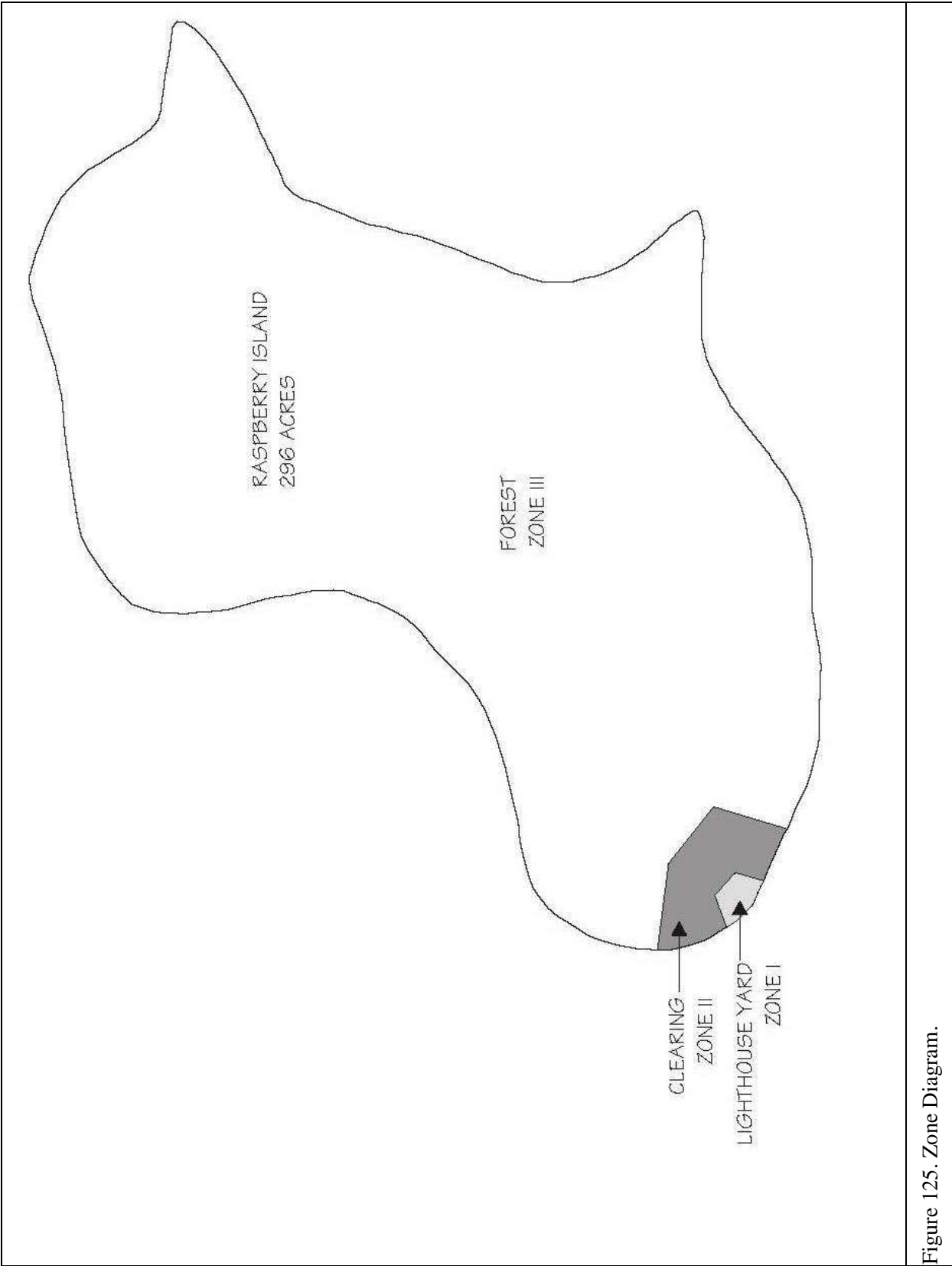


Figure 125. Zone Diagram.

The spatial organization and functional patterns evident within the lighthouse yard illustrate human use from throughout the period of significance. The historic spatial organization, including patterns of circulation and locations of historic structures, remains evident, reflecting historic patterns and relationships. The nature and location of small-scale features changed over time, reflecting the individual tastes and needs of island residents.

The first priority for management of the lighthouse yard is preservation of the views and vistas from the yard towards Lake Superior and the historic features that contribute to the yard's character. These features include the buildings and structures, circulation system, ornamental trees and shrubs, and small-scale historic elements. Every effort must be made to assure that the character and integrity of the cultural landscape within the yard is, at minimum, maintained at present levels. Rehabilitation of buildings, structures, and small-scale features to assure their continued preservation, accommodate site interpretation, and permit compatible new uses, such as seasonal occupancy by the Lakeshore staff, is acceptable.

Treatment alternatives for the lighthouse yard will maintain the present level of integrity of the basic spatial relationships and physical distinctions between the yard, the clearing, the forest, and the lake. Within the yard, the spatial relationships between the various contributing landscape elements, including buildings, circulation patterns, vegetation, and views will be preserved. The proposed alternatives differ in the level of intervention permitted to rehabilitate the lighthouse yard and its constituent landscape elements. Alternative I will maintain the status quo, with minimal reconstruction of missing elements. Alternatives II and III are identical in that they both will rehabilitate the yard to its appearance during the 1902-1947 period. This corresponds to the primary period of interpretation by the Lakeshore at Raspberry Island.

## **Zone II: Clearing**

The station clearing extends from the edge of the native forest to the location of the historic fence that separated the clearing from the lighthouse yard. Throughout the historic period the clearing defined the arc required for the navigation light to be seen by passing ships. This was its principal function, but the clearing also served as an area where livestock could forage and where station residents grew field crops such as barley, oats, and hay. The clearing was kept clear of any vegetation tall enough to obscure the sweep of the light by means of regular cycles of burning that maintained the desired level of vegetation.

The entire clearing is historically significant and is a contributing feature within the cultural landscape. However, the historical integrity of the clearing is low, due to the cessation of maintenance after 1957 and the subsequent encroachment of the surrounding forest. Reforestation has largely eliminated the historically open character of the clearing, blurring the distinct boundary that once existed between the forest and the clearing. The clearing continues to serve as a transition between the forest and the lighthouse yard, but current conditions limit the interpretive value of this area. Some features located in the clearing, most notably the surviving range marker, have deteriorated and require stabilization.

Alternatives for treatment of the station clearing will preserve and rehabilitate the basic spatial relationships and physical distinctions between the clearing, the yard, the forest, and the lake. The proposed alternatives differ in the level of intervention permitted to rehabilitate the clearing and its constituent landscape elements. Alternative I will establish a defensible fire perimeter for



the lighthouse yard be removing trees and brush within one hundred feet of the extant building cluster. Alternative II incorporates the fire perimeter and calls for removal of trees and brush west of the historic limits of the navigation light's arc (145 degrees and 340 degrees). Alternative III reestablishes the full extent of the historic clearing and maintaining the clearing through prescribed fire.

### **Zone III: Forest**

The native forest on Raspberry Island is a significant plant system that supported lighthouse operations by serving as a source of firewood, building materials, edible plants, and game. The native forest is the dominant natural feature on the island, covering approximately 280 (94.6 percent) of the island's 296 acres (Figure 126). The forest is a remnant of the pre-settlement forest, characterized by white cedar, balsam fir, and birch, with a dense understory of Canadian yew.

Though never commercially logged, keepers thinned the forest for over eighty years by cutting and hauling firewood for domestic and industrial use at the lighthouse. The historic trails and its subsistence use for food, game, and firewood represent the cultural values of the forest.

The forested portion of the island is currently included in the Apostle Islands Wilderness Study. Consequently, the CLR does not address management of the forest area as a cultural landscape; it will be managed for wilderness values under the Wilderness Study and other subsequent management plans.



Figure 126. Forest in relationship to light station clearing.

## Alternatives for Treatment

### Alternative I

Alternative I preserves the landscape's existing forms, materials, and integrity through immediate stabilization, ongoing preservation maintenance, and repair of historic materials and features. This alternative requires the fewest changes to the existing landscape at Raspberry Island (Figure 127).

The Historic Structure Report (HSR) for the Raspberry Island Lighthouse recommends rehabilitation of the building for use as an interpretive museum (south half of building) and seasonal living quarters for NPS personnel (north half of building).<sup>3</sup> Rehabilitation of the interior will occur after the building envelope is stabilized. This work may entail some "destructive" investigation to determine the condition of existing drainage systems around the base of the building.

Proposed upgrades to site utilities required to support the rehabilitation of the lighthouse include introduction of toilet facilities in the north half of the lighthouse (with associated septic tank, pump tank, and leach field); excavation of a well east of the barn to provide potable water to the lighthouse; and construction of a photovoltaic array (with associated equipment) to provide electricity. The toilet and water upgrades will have little, if any, effect upon the cultural landscape. The septic tank and pump tank will be buried east of the lighthouse, while the leach field will be placed within the clearing, approximately 135 feet northeast of shed #2. The new well will be placed east of the barn, in close proximity to the present water tank. Water lines between the well and the lighthouse will be underground. The photovoltaic array will be placed approximately forty feet east of the barn. The array will be somewhat visible from the lighthouse tower and yard, but this area is already occupied by a non-historic water tank and propane tank and appears to represent the least intrusive and most practical location for the array. Support facilities for the array (batteries, generator, and controls) will either be located within the fog signal building or east of the barn. The former option will have significantly less effect upon the cultural landscape.

The HSR presents two options for "exterior restoration" of the lighthouse and, by inference, the other buildings and structures at the site.<sup>4</sup> Option No. 1 proposes to restore "the entire station" (both the individual structures and the site) to the period 1914-1924. Option No. 2 proposes preservation of the lighthouse and site "primarily as they exist today" reflecting the period of 1915-1941. The only buildings and structures for which the HSR provides treatment and design recommendations are the lighthouse, the concrete tramway and sidewalks and the fog signal building.

Other extant historical buildings and structures within the lighthouse yard should be stabilized and a cyclical preservation maintenance program implemented.<sup>5</sup> Buildings may be rehabilitated

---

<sup>3</sup> Quinn Evans Architects, *Historic Structures Report: Raspberry Island Lighthouse*, 94.

<sup>4</sup> *Ibid.*, 95.

<sup>5</sup> Shed #2 in particular is in immediate need of attention. The sod has built up around the base of the building causing the board and batten siding to rot from the bottom. There is likely damage to the building foundation, but this can only be determined after removal of the sod from around the base of the building.

to accommodate new, compatible uses. Extant small-scale features, both those dating from the period of significance and those reconstructed by the NPS, should be included in the cyclic preservation maintenance program.

Elements of the historical circulation system, including the concrete walks and the concrete stair that connects the lighthouse yard with the dock will be preserved and maintained. Grass should be trimmed from the edges of all the walks and from between the joints separating walkway sections so as to return these features to their full historic appearance. Refer to Figures 73 and 76, which illustrate how sod has encroached upon historic walkway features. The full extent of cement walkways should be exposed and maintained. Pedestrian access will be maintained through the area for interpretive purposes. Boat access for NPS and private boats will be maintained.

The lawn and garden areas within the lighthouse yard will be maintained at current standards of care. This alternative maintains the status quo through compliance with the legal mandates of the park's enabling legislation, which states that the historic resources, which include the lighthouse stations, in the Apostle Islands will be preserved. The Lakeshore personnel will continue to maintain the reconstructed ornamental flowerbeds and vegetable garden plots through maintenance of plant and cobble material. Invasives will be treated following current NPS guidelines, while lawns within the lighthouse yard will be maintained to current standards. A certified arborist is not required for removal of the damaged mountain ash, but should be consulted for future maintenance of healthy ornamental trees in the yard.

A defensible fire perimeter will be created extending one hundred feet from the building cluster to ensure the safety of the cultural resources located within the lighthouse yard. Creation of a fire perimeter will entail mechanical removal of all trees and all brush more than four feet in height within the perimeter. Maintenance of the perimeter will require periodic removal of encroaching brush and trees. Trails within the clearing will be maintained as at present.

### **Alternative I: Evaluation**

This treatment alternative maintains the historic period land use pattern, physical relationships, features, and overall character of the lighthouse yard, and incorporates proposed plans to rehabilitate the lighthouse and upgrade utilities on the island. Historic buildings, structures, and objects within the lighthouse yard and clearing will be maintained at current levels, despite the fact that some of these features are reconstructions that do not conform to current NPS standards.

The existing views from the lighthouse yard to the lake will be preserved and maintained. The building cluster within the lighthouse yard will continue to be the principal focus of preservation and maintenance efforts, as well as of interpretation. This alternative provides no protection or stabilization of identified archaeological features. It does not facilitate interpretation of the larger landscape, since the clearing would not reflect the period of interpretation.

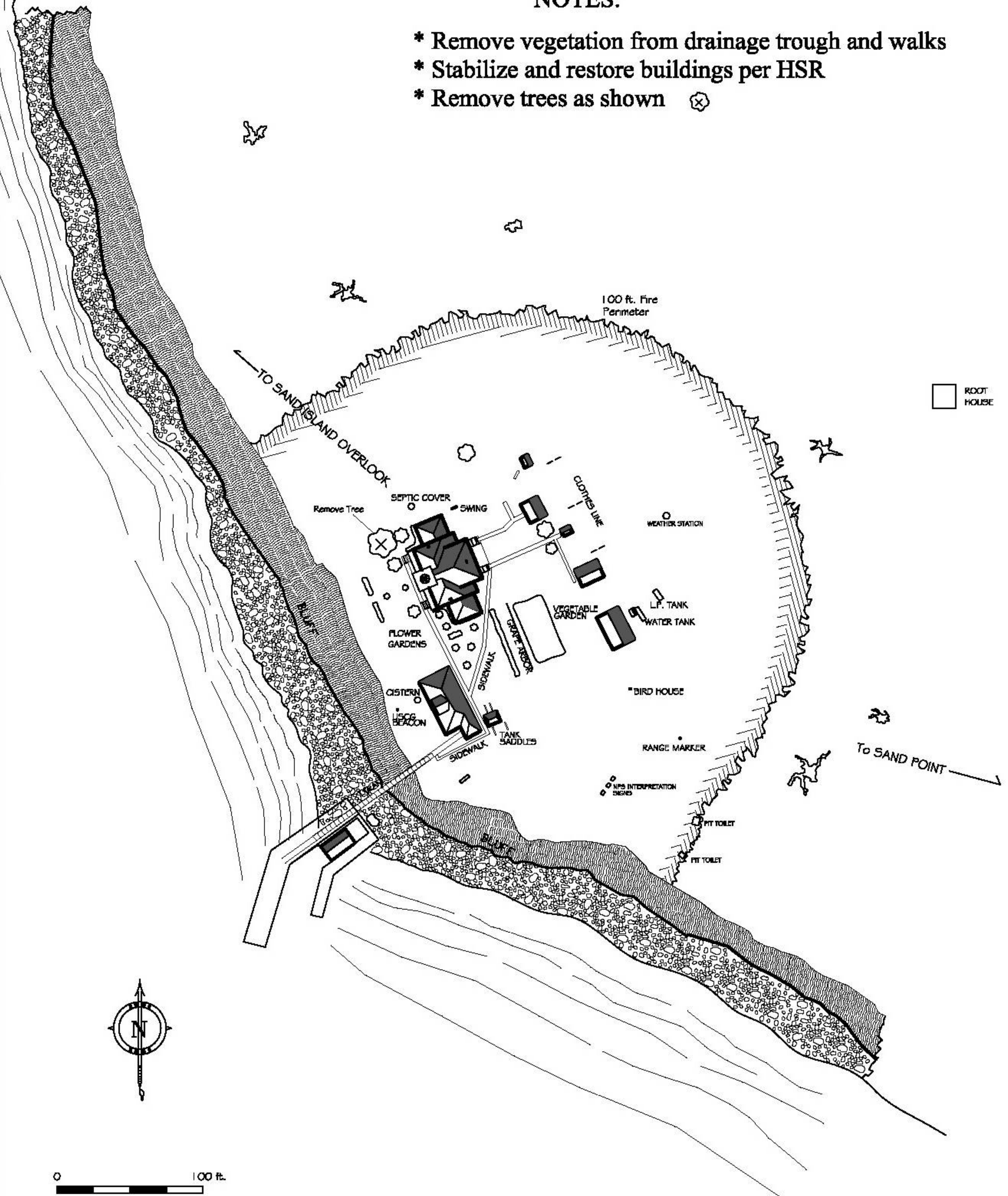
The creation of a defensible fire perimeter extending one hundred feet into the clearing beyond the building cluster constitutes the principal difference between this alternative and the status quo. This perimeter will afford increased protection from wildfires to the historic resources within the lighthouse yard.

INSERT 11x17 MAP

Figure 127. Alternative I.

## NOTES:

- \* Remove vegetation from drainage trough and walks
- \* Stabilize and restore buildings per HSR
- \* Remove trees as shown ⊗





Costs for establishing a safe fire perimeter include wages for a crew of ten, island transportation, equipment and removal of trees to the mainland. Local grubbing contractors from Madeline Island have estimated this project as requiring approximately two days of tree removal at \$1,400 to \$2,200 per day, two days of chipping (small trees and shrubs) at \$3,500, and removal of larger trees off the island at \$5,000. The total minimum estimate for establishing the fire perimeter is approximately \$11,300; the high end of the cost estimate is \$12,900.

Maintenance of the fire perimeter will require twice yearly rough mowing with a 'bush-hog' by NPS maintenance crews. Calculated at 4 hours of work per mowing this will increase the current maintenance budget by approximately \$140 per year.

It is assumed that maintenance and preservation of the contributing landscape elements within the lighthouse yard could be achieved within the existing landscape maintenance budget. Current labor costs for trail and grounds maintenance equal approximately \$2500, with transportation to the island calculated at roughly \$950. The garden is maintained by a crew of volunteers at no cost; however, transportation for volunteers is estimated at approximately \$700 per annum. The total annual current costs are approximately \$4,150. Additional mowing incurred by establishing a safe fire perimeter will bring the annual cost of grounds maintenance \$4,290.

## **Alternative II**

Alternative II incorporates all provisions for the preservation, maintenance, and rehabilitation of the historic buildings and structures within the lighthouse yard detailed in the HSR and Alternative I. Additionally, Alternative II calls for rehabilitation of landscape elements within the lighthouse yard to reflect the period 1902-1947 (Figure 128). The HSR calls for rehabilitation of the lighthouse to this period, which would assure a visual continuity between the lighthouse and the yard and simplify and clarify interpretation.

Under Alternative II historic landscape elements missing from the lighthouse yard – the flagstaff, birdbath, range markers and fencing, would be reconstructed. The reconstructed swing would be replaced with a more historically accurate reconstruction based upon detailed analysis of historic photographs. Extant small-scale features that do not date from the period 1902-1947, including the weather station, will be removed. The Coast Guard navigation beacon will remain as the functioning navigational aid.

The walkways comprising the circulation system within the lighthouse yard will be maintained as under Alternative I. In addition, the cinder path between the barn and the fog signal building would be rehabilitated/reconstructed and archaeological investigations undertaken to determine the extent and condition of surviving portions of the wood walkways. Surviving portions of the wood walkways would be preserved and used to interpret the earlier character of the site's circulation. New maintenance procedures will be implemented to protect the plank walks from lawn mowing equipment.

Under this alternative, the ornamental and vegetable gardens will be rehabilitated to more accurately reflect their historic locations, contents, and spatial configurations, based upon available historical documentation. Landscape archaeology will not be conducted. Planting material detailed in historic records, but presently not included within the plots, will be

reintroduced. Non-historic plantings, including the grape vine and its associated arbor, will be removed (Figure 129).

A soil analysis would be arranged through the Bayfield County Extension Agency. This analysis will provide information on appropriate amendments to be used to ensure healthy vegetation on site. A certified arborist is not needed for removal of the damaged mountain ash. However, a certified arborist should be consulted for future maintenance of healthy trees in the lighthouse yard.

The post and wire fence that separated the yard from the clearing between 1902 and 1947 will be reconstructed. Its location and appearance will be based upon historic photographs. Gates or openings will be provided in the fence to permit visitor access to the trail to the sand point and the pit toilets. Specific treatments for the lighthouse yard proposed under this alternative are discussed in the 'Proposed Actions' section. Move picnic tables, interpretive signs, and wayside exhibits outside the fenced area. The waysides currently on site should be relocated to a less obtrusive location.

The 100-foot fire perimeter described for Alternative I is included in Alternative II. Additionally, brush and trees will be removed from the west edge of the clearing to reestablish the historic arc of the lighthouse beacon. The limits of the area within which removal of brush and trees will occur will be determined by extending a line along compass bearings from the lighthouse tower that correspond to the historic arc of the light. The arc will be slightly modified to the southeast to maintain a screen for the existing pit toilets. To the south, the line will extend along a bearing of approximately 145 degrees from the lighthouse tower. To the north, the line will extend along a bearing of approximately 340 degrees. This will reestablish the historic arc of the navigation light, but will not reestablish the entire area occupied by the historic station clearing. All trees and any brush more than four feet in height will be removed west of these bearing lines. Consult Lakeshore cultural resource staff prior to flagging vegetation for removal.

The historic trails that lead through the clearing will be maintained. Small-scale features associated with the clearing will be preserved. The extant range marker will be stabilized and preserved and the missing marker will be reconstructed, using the existing marker as a model, and placed in its approximate historic location, based upon historic photographs. Vegetation will be controlled around the range markers to assure that they are visible from both the lighthouse yard and the lake.

Archaeological documentation of the root house and the plank walks will be conducted to record these features and provide further information for their preservation. All proposed treatments under this alternative for elements within the clearing are discussed below under Proposed Actions.

## **Alternative II: Evaluation**

As with Alternative I, this alternative maintains the historic land use pattern, physical relationships, features, and overall character of the lighthouse yard, and incorporates proposed plans to rehabilitate the lighthouse and upgrade utilities on the island. Alternative II also provides for visual continuity between the proposed period of interpretation for the rehabilitated lighthouse and the lighthouse yard by calling for rehabilitation of the landscape elements within the yard to this period. This will include a program of selective reconstruction of significant, non-extant landscape elements, most importantly the fence and missing range marker.

INSERT 11x17 MAP

Figure 128. Alternative II.

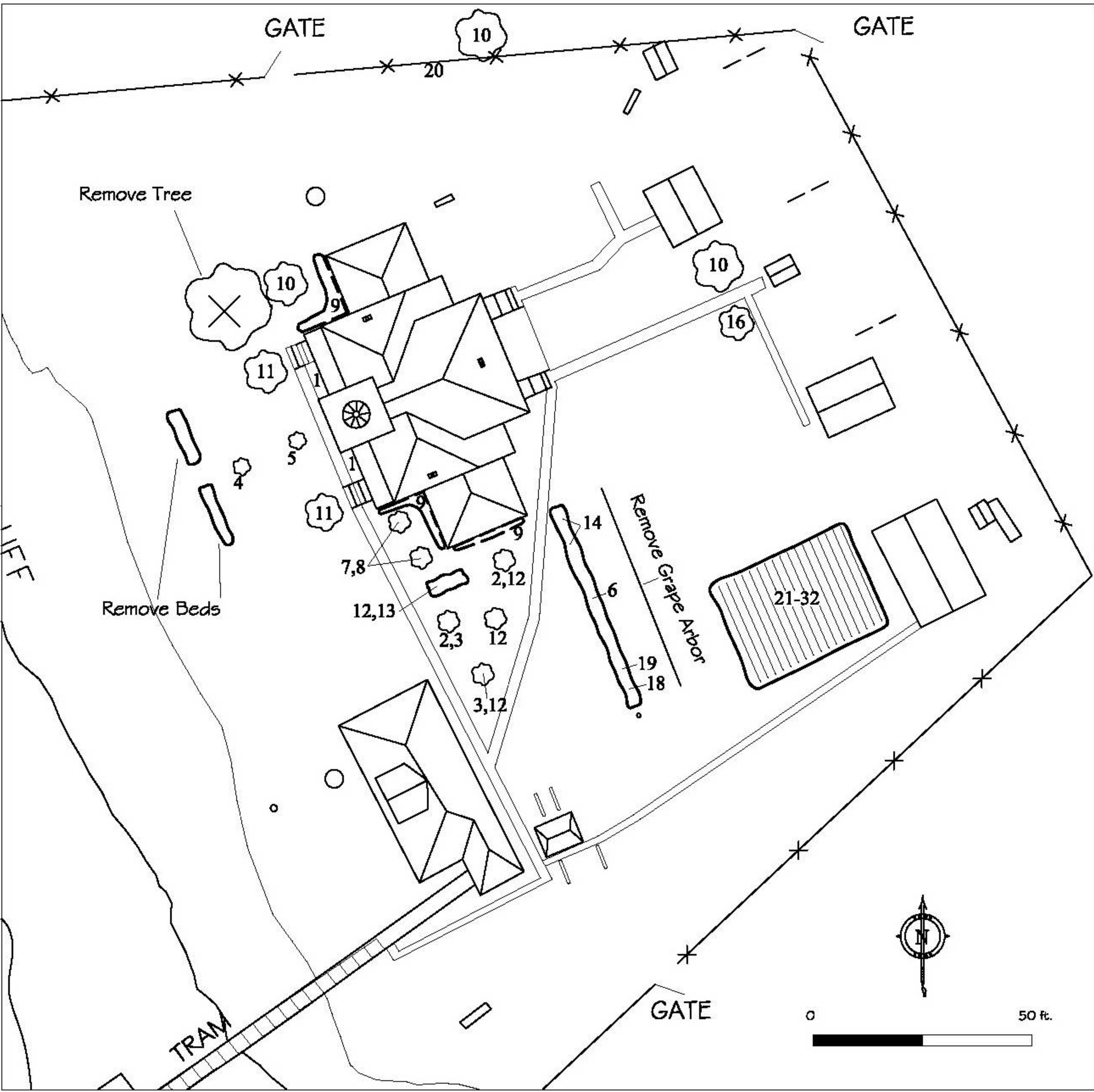


Figure 128. Alternative II.

INSERT 11x17 MAP

Figure 129. Planting plan.





#	Species	Botanical Name	Suggested Replacement
1.	Tiger Lily	( <i>Lilium columbianum</i> )	
2.	Pansy	( <i>Viola</i> sp.)	
3.	Dianthus	( <i>Dianthus</i> sp.)	
4.	Mountain Ash	( <i>Sorbus americana</i> )	
5.	Lilac	( <i>Syringa</i> )	<i>S. x hyacinthiflora</i> , <i>S.x persica alba</i>
6.	Gladiola/ Iris	( <i>Gladiolus</i> sp./ <i>Iris</i> sp.)	
7.	Astilbe	( <i>Astilbe</i> sp.)	<i>America</i> , <i>A.x arendsii</i>
8.	Nasturtium	( <i>Tropaeolum majus</i> )	
9.	Dahlia	( <i>Dahlia</i> sp.)	
10.	Daylily	( <i>Hemerocallis</i> sp.)	
11.	Peony	( <i>Paeonia officinalis</i> sp.)	
12.	Zinnia	( <i>Zinnia</i> sp.)	
13.	Petunia	( <i>Petunia</i> sp.)	
14.	Rose	( <i>Rosa</i> sp.)	
15.	Asparagus	( <i>Asparagus officinalis</i> )	
16.	Cherry	( <i>Prunus</i> sp.)	
17.	Currant	( <i>Ribes</i> sp.)	<i>R. rubrum</i> , <i>R. nigrum</i>
19.	Gooseberry	( <i>Ribes</i> sp.)	<i>R. lobbii</i>
20.	Asparagus	( <i>Asparagus officinalis</i> )	Purple Dutch, Mary Washington
21.	Onion	( <i>Allium cepa</i> )	Rossa Lunga, Walla Walla
22.	Lettuce	( <i>Lactuca sativa</i> )	Leaf Lettuce, Butterhead Kagramer Sommer
23.	Cucumber	( <i>Citruilus sativa</i> )	Straight Eight, Fanfare
24.	Bean	(Unidentified type)	Blue Lake, Black Turtle
25.	Squash	( <i>Cucurbitae</i> )	Burgess Buttercup, Zucchini Baby Round
26.	Pea	( <i>Pisum sativum</i> )	Cascadia, Green Arrow
27.	Rutabaga	( <i>Brassica napus</i> )	American Purple Top
28.	Pumpkin	( <i>Cucurbita pepo</i> )	Sugar Pie, Cinderella
29.	Tomato	( <i>Solanum lycopersicum</i> )	Brandywine, Black Krim
30.	Cabbage	( <i>Brassica oleracea</i> )	Discovery, Michihli
31.	Potato	( <i>Solanum tuberosum</i> )	German Butterball, Russet Nugget
32.	Beet	( <i>Beta vulgaris</i> )	Early wonder, Detroit Dark Red

Alternative II will facilitate a clearer understanding of the relationship between the lighthouse and the lighthouse yard. It will restore the feeling and association of the period of interpretation to the yard.

Alternative II provides a limited opportunity to enhance visitor understanding of the significant role of the clearing by reestablishing the historic arc of the navigation light. This will assist interpretation of the role the lighthouse played as an aid to navigation, but will not reestablish the entire area occupied by the historic station clearing. The arc will be slightly modified so that existing pit toilets will continue to be screened by vegetation.

This alternative ensures preservation of small-scale features in the clearing. Rehabilitation and reconstruction of the range marker system will allow this feature to be included in the interpretive program.

This alternative entails increased costs associated with reconstruction of the fence, rehabilitation of the extant range marker, and reconstruction of the missing range marker. Costs would also be incurred to establish the fire perimeter and navigation light arc within the clearing. Routine maintenance costs would increase because of the need to maintain both the reconstructed features and the newly established viewshed. Volunteers could help defray the costs of garden rehabilitation.

Creating a fire perimeter will entail costs to cut and remove the growth that presently exists within the 100-foot design criteria. This work will require equipment being barged from the mainland and removed trees being barged off the island for disposal.

Costs for establishing a safe fire perimeter and the viewshed along the west edge of the island include wages for a crew of ten, island transportation, equipment and removal of trees. Local grubbing contractors from Madeline Island have roughly estimated this project as requiring three days of tree removal at \$1,400 to \$2,200 per day, three days of chipping (small trees and shrubs) at \$7,000, and removal of larger trees off the island at \$6,700. The total minimum estimate for establishing the fire perimeter and viewshed is approximately \$17,900; the estimated high end of this project is \$20,300.

Maintenance of the fire perimeter and viewshed will consist of twice yearly mowing by NPS maintenance crews. Calculated at 8 hours of work per mowing this will increase the maintenance budget by approximately \$280 per year.

It is assumed that maintenance and preservation of the contributing landscape elements within the lighthouse yard could be achieved within the existing landscape maintenance budget. Current labor costs for trail and grounds maintenance equal approximately \$2500, with transportation to the island calculated at roughly \$950. The garden is maintained by a crew of volunteers at no cost; however, transportation for volunteers is estimated at approximately \$700 per annum. The total current annual costs for ground maintenance are approximately \$4,150. Ground maintenance costs will likely increase to an annual sum of \$4,430.

### **Alternative III**

This treatment differs from Alternative II only in its treatment of the clearing (Figure 130). All actions proposed within the lighthouse yard under Alternative II are included in this alternative. Alternative III proposes to rehabilitate the physical extent and visual character of the historic clearing by removal of trees and brush and introduction of a prescribed fire regimen.

Actions proposed under this alternative would reestablish regionally native species in the clearing that are currently present on the island. Timothy, a historic forage crop, would be included in the plant material. Once the clearing approximates its historic configuration, it would be maintained by means of low intensity prescribed burning to minimize the encroachment of the forest and noxious weeds, restore the historic visual aspects of cyclical controlled fire, and enhance the ecological function of the clearing. All proposed treatments for the clearing under this alternative are discussed below under Proposed Actions.

### **Alternative III: Evaluation**

This treatment alternative maintains historic land use patterns, physical relationships, features, and the overall character of the site. It reestablishes and reconstructs specific features in the yard and clearing to enhance the integrity of the landscape and facilitate communication of the historical significance and physical relationships of the various landscape elements to the public. It establishes plant communities that are compatible with the historic open meadow character of the clearing. Low intensity burns will control noxious weeds and the encroaching forest while reestablishing the historic aesthetic of the site. This option increases the interpretive potential of the island's cultural landscape.

INSERT 11x17 MAP

Figure 130. Alternative III.





Figure 130. Alternative III.



Costs under this alternative for work within the lighthouse yard will be identical to the costs estimated under Alternative II. Rehabilitation of the clearing will entail significant costs to cut and remove the trees that presently exist within the clearing. Initial costs for clearing an area of less than three acres on the island have been estimated by local grubbing contractors from Madeline Island. The estimated expense of this project includes four days of tree removal at \$1,400 to \$2,200 per day and removal of larger trees off the island at \$9,000. Smaller shrubs and brush would be removed with the fire. The total minimum estimate for establishing the historic clearing is approximately \$14,600; the high-end estimate is \$17,800.

Cyclic maintenance costs will likely increase; though burning is typically more cost effective than mowing or other maintenance procedures that might be utilized within the clearing. Both the Forest Service and USGS have published cost-effective analyses for prescribed fires nation wide. Their research was used for estimating the costs involved in a program of prescribed burns at Raspberry Island. Costs and hours involved to conduct a burn are inversely related to the size of the burn area. A similar study area of six acres on two small islands entailed a 2-man burn team, 2 drip torches, and one 150-gallon pumper to complete the burn. The estimated cost for these island properties is \$100 per acre.<sup>6</sup> Due to island logistics, treatment of Raspberry Islands' approximately four-acre clearing, of which only two to three acres would be burned, can be expected to require a slightly larger and more complex level of effort and incur higher costs. Other sources suggest that prescribed burns range in cost from \$40 to \$200 per acre with smaller acreages at the top of the scale. Mechanical maintenance of the same area can cost up to ten times as much as burning.<sup>7</sup>

Routine maintenance of the burn area would occur on a three to five-year cycle. Using the estimated \$200 per acre cost for three acres, the cost of burning is estimated at \$600. This cost spread over the five-year burn cycle reduces the annual maintenance cost for maintaining the clearing to \$120.

Maintenance and preservation of the contributing landscape elements within the lighthouse yard could be achieved within the existing landscape maintenance budget. Current labor costs for trail and grounds maintenance equal approximately \$2500, with transportation to the island calculated at roughly \$950. A crew of volunteers maintain the garden at no cost; however, transportation for volunteers is estimated at approximately \$700 per annum. The total current annual ground maintenance costs are approximately \$4,150. Addition of the \$120 per year (\$600/five-year burn cycle) clearing maintenance will bring the total annual projected grounds maintenance costs to \$4,270.

---

<sup>6</sup> <http://www.npwrc.usgs.gov/resource/tools/burning/burning.htm>. Appendix B and [nps.gov/seki/fire/pdf/po\\_fe99/pdf](http://nps.gov/seki/fire/pdf/po_fe99/pdf)

<sup>7</sup> [www.ebparks.org/fire/rxfire/round\\_valley\\_03](http://www.ebparks.org/fire/rxfire/round_valley_03) and [www.redding.com/specials/rxfire](http://www.redding.com/specials/rxfire)

Table 7. Treatment Option Matrix

	LIGHTHOUSE YARD	CLEARING
Alternative I	No action	Establish and maintain fire perimeter
Alternative II	Rehabilitate to 1902-1947	Establish and maintain fire perimeter. Establish and maintain navigation light arc.
Alternative III	Rehabilitate to 1902-1947	Rehabilitate extent and character of clearing

## Proposed Actions: Lighthouse Yard - Alternatives II and III

### Fence

Wood post and wire fencing, which existed for most of the from 1902-1947, will be reconstructed (see Figures 36 and 131). The reconstructed fence will consist of white-washed cedar posts and wire fencing. Three gate openings have been identified in the historic fence: one directly north of the lighthouse; one at the north end of the east fence, and one on the south fence near the oil building (see Figures 118 and 119). Adjustments in the location of the gate openings, or provision of additional openings, may be required to accommodate modern pedestrian circulation requirements, or to compensate for the effects of erosion. If adjustments are needed, park staff may review the appropriateness of the location with qualified cultural resources staff in the regional office.

### Flagstaff

As a result of bluff erosion, the location of the station's primary flagstaff, west of the lighthouse, has been lost. This feature will be replaced, but its location must necessarily accommodate the new configuration of the bluff. The location of the flagstaff will be determined by public safety considerations, soil stability, and visual presence. Ideally, the flagstaff will be placed in line with the navigation light, no closer than six feet from the edge of the bluff (Figure 131). The location of the flagstaff could be incorporated into the interpretation of bluff erosion.

The reconstructed flagstaff should be designed to reflect the historic flagstaff, which included a topmast and a gaff.

Because the target date for interpretation of the lightstation is ca. 1920, the flagstaff near the present garden plot—which dates to later in the period of significance—will not be reestablished

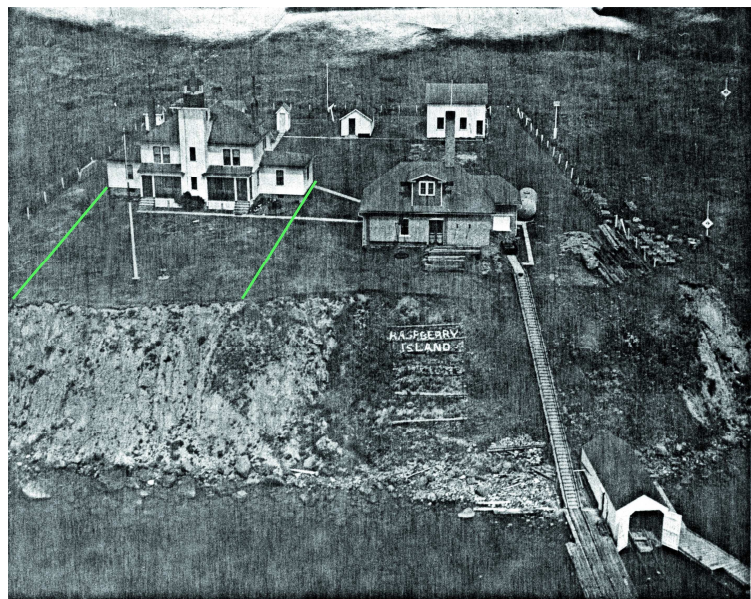


Figure 131. Limits for replacement of western flagstaff and birdbath (Lakeshore archives).

at this time. The pole supports may be preserved as long as possible. At the point they are deteriorated, Lakeshore staff will consult with cultural resource specialists to determine if they should be replaced in kind.

### **Birdbath**

A birdbath will be reconstructed of wire, concrete and river rock, consistent with the fabric apparent in historic photographs. The birdbath measures approximately 2.5 feet in height, with a bowl diameter of approximately 1.5 feet (Figure 132; also see Figure 35). The location of the birdbath is based upon historic photographs. It will be placed approximately four feet south of the flagstaff west of the lighthouse, in a line parallel to the west façade of the lighthouse and the fog signal building (see Figure 131). This location will preserve the relationship between the birdbath and the flagstaff.

### **Swing**

The existing swing, a reconstruction built by the NPS, will be replaced with a similar element that more accurately reflects the dimensions of the historic feature. The swing height may be determined by comparison of the feature with the lighthouse in historic photographs. Photographic documentation suggests that the swing's height should correspond to the height of the meeting rails of the second story windows in the east façade of the lighthouse (see Figure 115).

### **Range Marker**

The extant range marker will be documented and rehabilitated by patching and repainting. A new range marker, matching the materials and appearance of the extant feature, will be reconstructed and placed in its approximate original location based upon evidence from historic photographs (Figure 133; see also Figure 36). Channel conditions should be confirmed prior to reinstallation of this navigational aid; consultation with the U.S. Coast Guard may also be required.



Figure 132. Detail of Figure 34 showing size of birdbath. Feature approximately 2'6" tall x 1'6" in diameter (Lakeshore archives).



Figure 133. Range marker locations, ca. 1936 (Lakeshore archives).

### **Vegetable Garden**

As further documentation and analysis of the historic flower and vegetable beds becomes available, the Lakeshore may consider relocating the vegetable garden plot to more closely approximate its historic location, in accordance with the 1910 map and ca. 1940 photographs (Figure 134). The relocated garden should be a rectangular plot measuring approximately 35 feet x 25 feet. The north edge of the plot will be parallel to the north façade of the barn, but placed approximately four feet north of the line of the barn's north façade. The south edge of the plot will be aligned with the barn's entry. The plot's east boundary will be placed parallel to the west façade of the barn and approximately three feet west of the north-south walkway west of the barn. The plot's west boundary will be located approximately midway between the east edge of the plot and the pole supports east of the fog signal building. Furrow orientation will run north/south. Garden crops will only include vegetables identified in the Keepers' logs. Heirloom varieties of garden plants are suggested and readily available either locally or by mail order. Undocumented crops, such as grape and highbush cranberry, will be removed.



Table 8. Vegetable Garden Crops

Vegetables	Possible heirloom varieties
Onion ( <i>Allium cepa</i> )	Rossa Lunga, Walla Walla
Lettuce ( <i>Lactuca sativa</i> )	Leaf Lettuce, Butterhead Kagramer Sommer
Cucumber ( <i>Citrullus sativa</i> )	Straight Eight, Fanfare
Bean (Unidentified type)	Blue Lake, Black Turtle
Squash ( <i>Cucurbitae</i> )	Burgess Buttercup, Zucchini Baby Round
Pea ( <i>Pisum sativum</i> )	Cascadia, Green Arrow
Rutabaga ( <i>Brassica napus</i> )	American Purple Top
Pumpkin ( <i>Cucurbita pepo</i> )	Sugar Pie, Cinderella
Asparagus ( <i>Asparagus officinalis</i> )	Purple Dutch, Mary Washington
Tomato ( <i>Solanum lycopersicum</i> )	Brandywine, Black Krim
Cabbage ( <i>Brassica oleracea</i> )	Discovery, Michihli
Potato ( <i>Solanum tuberosum</i> )	German Butterball, Russet Nugget
Beet ( <i>Beta vulgaris</i> )	Early Wonder, Detroit Dark Red



Figure 134. Detail of garden plot location, ca. 1940 (Lakeshore archives).



## Flower Gardens/Ornamental Plantings

The flower gardens and ornamental plantings will be rehabilitated and reconstructed to approximate their appearance in the 1920s (Figure 135). This entails removal of the existing grape arbor and the two linear beds farthest west of the lighthouse. Extant beds, generally the foundation plantings and cobbled beds, that are historically accurate in placement, but which lack historical planting material will be replanted according to the planting plan. Non-historic ornamental vegetation to be removed from the lighthouse yard includes Chamomile (*Anthemis tinctoria*), Clove (*Syzgium aromaticum*), Columbine (*Aquilegia*), Gaillardia (*Gaillardia pulchella*), Hosta (*Hosta sieboldiana*), Lupine (*Lupinus*), Marigold (*Calendula officinalis*), Phlox (*Phlox*), Rudbeckia (*Echinacea*), Shasta Daisy (*Leucanthemum*), Snap Dragon (*Antirrhinum*), Sweet Alyssum (*Lobularia*), and Sweet Pea (*Lathyrus*). The planting plan should be a guide for general placement of planting material throughout the lighthouse yard.

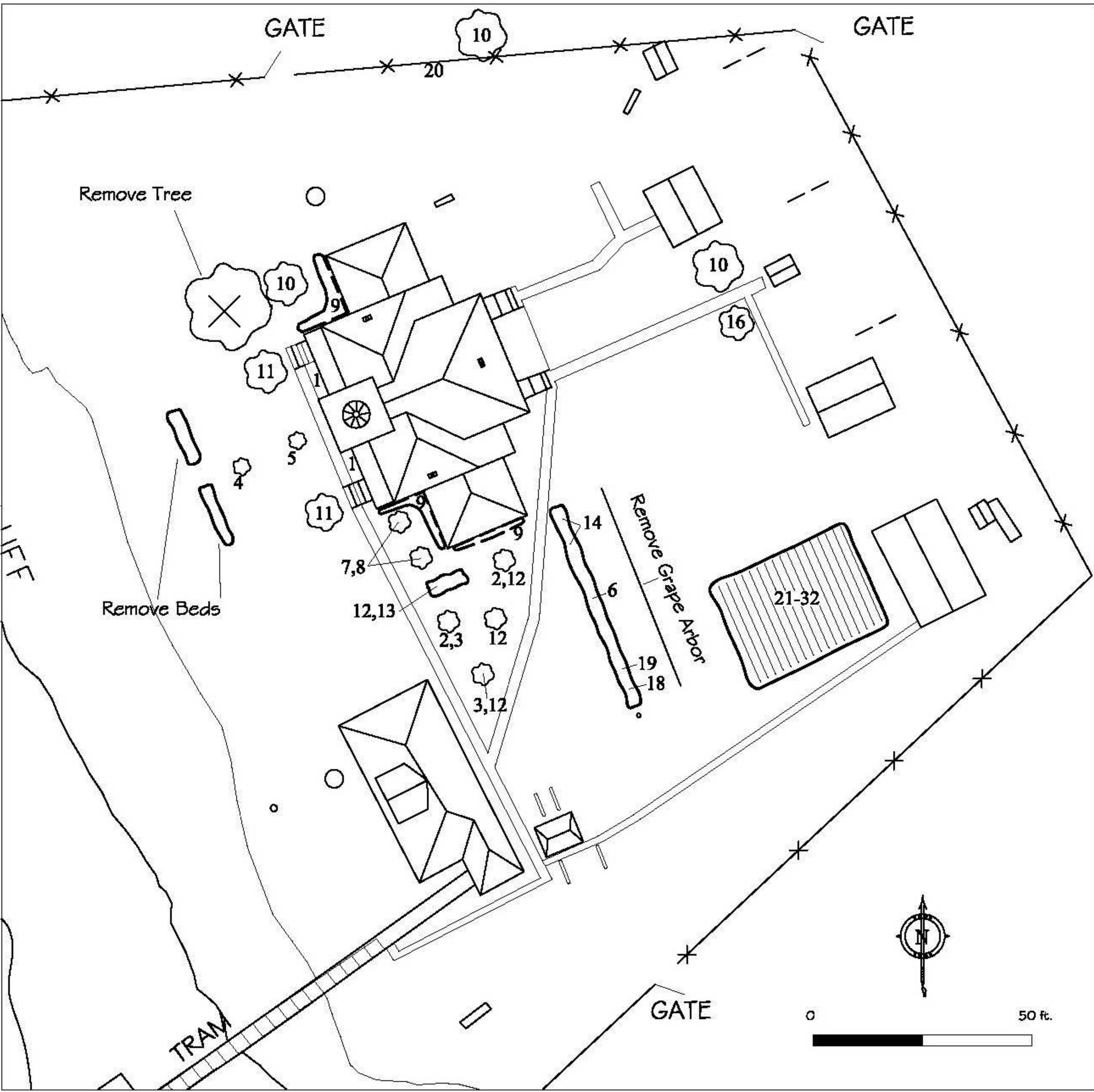
A certified arborist will be consulted for care of ornamental trees (*Sorbus*), shrubs (*Syringa*), and edibles (*Prunus* and *Ribes*).

Table 9. Flower Garden/Ornamental Plantings

Historic Ornamental/Edible Vegetation	Possible heirloom varieties
Lilac ( <i>Syringa</i> )	<i>X hyacinthiflora</i> , <i>X persica alba</i>
Astilbe ( <i>Astilbe</i> sp.)	America, <i>X arendsii</i>
Currant ( <i>Ribes</i> sp.)	<i>rubrum</i> , <i>nigrum</i>
Gooseberry ( <i>Ribes</i> sp.)	<i>lobbii</i>

INSERT 11x17 MAP

Figure 135. Planting plan.



#	Species	Botanical Name	Suggested Replacement
1.	Tiger Lily	( <i>Lilium columbianum</i> )	
2.	Pansy	( <i>Viola</i> sp.)	
3.	Dianthus	( <i>Dianthus</i> sp.)	
4.	Mountain Ash	( <i>Sorbus americana</i> )	
5.	Lilac	( <i>Syringa</i> )	<i>S. x hyacinthiflora</i> , <i>S.x persica alba</i>
6.	Gladiola/ Iris	( <i>Gladiolus</i> sp./ <i>Iris</i> sp.)	
7.	Astilbe	( <i>Astilbe</i> sp.)	<i>America</i> , <i>A.x arendsii</i>
8.	Nasturtium	( <i>Tropaeolum majus</i> )	
9.	Dahlia	( <i>Dahlia</i> sp.)	
10.	Daylily	( <i>Hemerocallis</i> sp.)	
11.	Peony	( <i>Paeonia officinalis</i> sp.)	
12.	Zinnia	( <i>Zinnia</i> sp.)	
13.	Petunia	( <i>Petunia</i> sp.)	
14.	Rose	( <i>Rosa</i> sp.)	
15.	Asparagus	( <i>Asparagus officinalis</i> )	
16.	Cherry	( <i>Prunus</i> sp.)	
17.	Currant	( <i>Ribes</i> sp.)	<i>R. rubrum</i> , <i>R. nigrum</i>
19.	Gooseberry	( <i>Ribes</i> sp.)	<i>R. lobbii</i>
20.	Asparagus	( <i>Asparagus officinalis</i> )	Purple Dutch, Mary Washington
21.	Onion	( <i>Allium cepa</i> )	Rossa Lunga, Walla Walla
22.	Lettuce	( <i>Lactuca sativa</i> )	Leaf Lettuce, Butterhead Kagramer Sommer
23.	Cucumber	( <i>Citruilus sativa</i> )	Straight Eight, Fanfare
24.	Bean	(Unidentified type)	Blue Lake, Black Turtle
25.	Squash	( <i>Cucurbitae</i> )	Burgess Buttercup, Zucchini Baby Round
26.	Pea	( <i>Pisum sativum</i> )	Cascadia, Green Arrow
27.	Rutabaga	( <i>Brassica napus</i> )	American Purple Top
28.	Pumpkin	( <i>Cucurbita pepo</i> )	Sugar Pie, Cinderella
29.	Tomato	( <i>Solanum lycopersicum</i> )	Brandywine, Black Krim
30.	Cabbage	( <i>Brassica oleracea</i> )	Discovery, Michihli
31.	Potato	( <i>Solanum tuberosum</i> )	German Butterball, Russet Nugget
32.	Beet	( <i>Beta vulgaris</i> )	Early wonder, Detroit Dark Red

## Cinder Path

The cinder path will be reconstructed in its historic location between the barn and the oil building. The path runs between the oil building and the south concrete oil cradle, curving slightly north toward the west edge of the garden, and then parallels the garden's south edge to the barn entry. The path is no wider than the barn entry, approximately three feet wide. (Figure 136; see also Figure 24). At present, it can be difficult to procure cinder, and potash is a common substitute. In this setting, however, potash would likely be blown away and thus would be neither economical nor ecological to use. An acceptable substitute would be the use of small (5 centimeters or less), dark-colored pumice stone. This is visually comparable to cinder and is readily available.

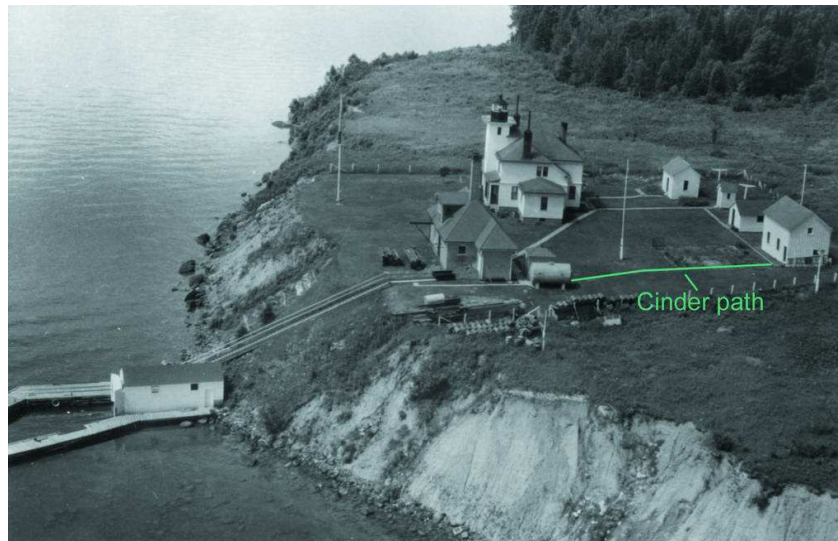


Figure 136. Cinder path and garden placement (Lakeshore archives).

## Cement Walkways

Remove encroaching sod from all walkways and maintain the edge to show the full extent of the cement members (Figure 73 and 76).

## Soil Analysis

Amendments and mulches needed to improve soil conditions within the yard may be determined by soil analysis. Improved soil conditions will increase the health of vegetation and reduce maintenance costs. Obtain a soil analysis through the Bayfield County Extension Agency for a cost of \$15.00. Results are usually available in two to four weeks. Contact: John Markus, Agent, 117 E. 5<sup>th</sup> Street, Washburn, WI, (715) 373-6104. Mulch all flowerbeds and gardens to help conserve water and reduce exotic weeds.

## Damaged Vegetation

A certified arborist should be engaged to provide for the care of healthy ornamental trees within the lighthouse yard. However, complete removal of a specimen does not require an arborist's services. Remove the damaged mountain ash northwest of the lighthouse to clear the area of dead material and reestablish the open edge along the field (see Figure 107). The location of replacement trees may be determined by consulting historic photographs (see Figure 34).



## **Lighthouse Yard**

The flowerbeds and plantings in the lighthouse yard will reflect evidence available in historic photos. The purple lilac, west of the lighthouse, should be replaced with a white variety. Suggested varieties include *Syringa x hyacinthiflora* 'Mt. Baker' or *Syringa x persica alba*. The planting plan, based on historic photos, will be followed for the cobble-bordered flowerbeds and mass plantings.

## **Grape Arbor**

Remove the non-historic grape arbor located west of the present vegetable garden. Record information regarding the location, spatial configuration, and history of this feature to aid in future documentation of the site.

## **Archeological Features**

Conduct archeological investigation to document the extent of the remaining portions of the plank walk adjacent to the assistant keepers' privy and in front of the barn. Until completion of the archeological investigations current maintenance procedures should be modified to ensure the protection of these resources. Do not use riding mowers around the plank walk remnants, as the weight of the machinery could affect the stability of the artifacts. Use of a 'weed eater' to maintain an acceptable lawn height in these areas would eliminate the weight issue until archaeological investigations are completed. Other areas to be considered for archeological investigation of plank walks include the area of the clothesline, where plank walks are known to have existed during the period of significance. Documentation and preservation of these archaeological features will enhance interpretation of the site circulation system and its reflection of the social hierarchy of lighthouse life.

Archeological investigations should also be undertaken to record the ca. 1935 root house located in the clearing east of the yard (Figure 137). Initial mapping completed in 2002 by HRA during preparation of this Cultural Landscape Report can serve as a basis for further documentation of this feature. Documentation and preservation of this feature will enhance interpretation of daily life at the station.

## **Proposed Actions: Clearing**

### **Trails**

Under all three alternatives, the sand point trail and the Sand Island overlook trail is maintained in accordance with current NPS standards as a part of the cyclical maintenance program.

### **Alternative I**

Create a defensible fire perimeter extending one hundred feet from the building cluster to ensure the safety of the cultural resources located within the lighthouse yard. Creation of a fire perimeter will entail mechanical removal of all trees all brush more than four feet in height within the perimeter. Maintenance of the perimeter will require periodic removal of encroaching brush and trees. Maintain the present trails within the clearing.



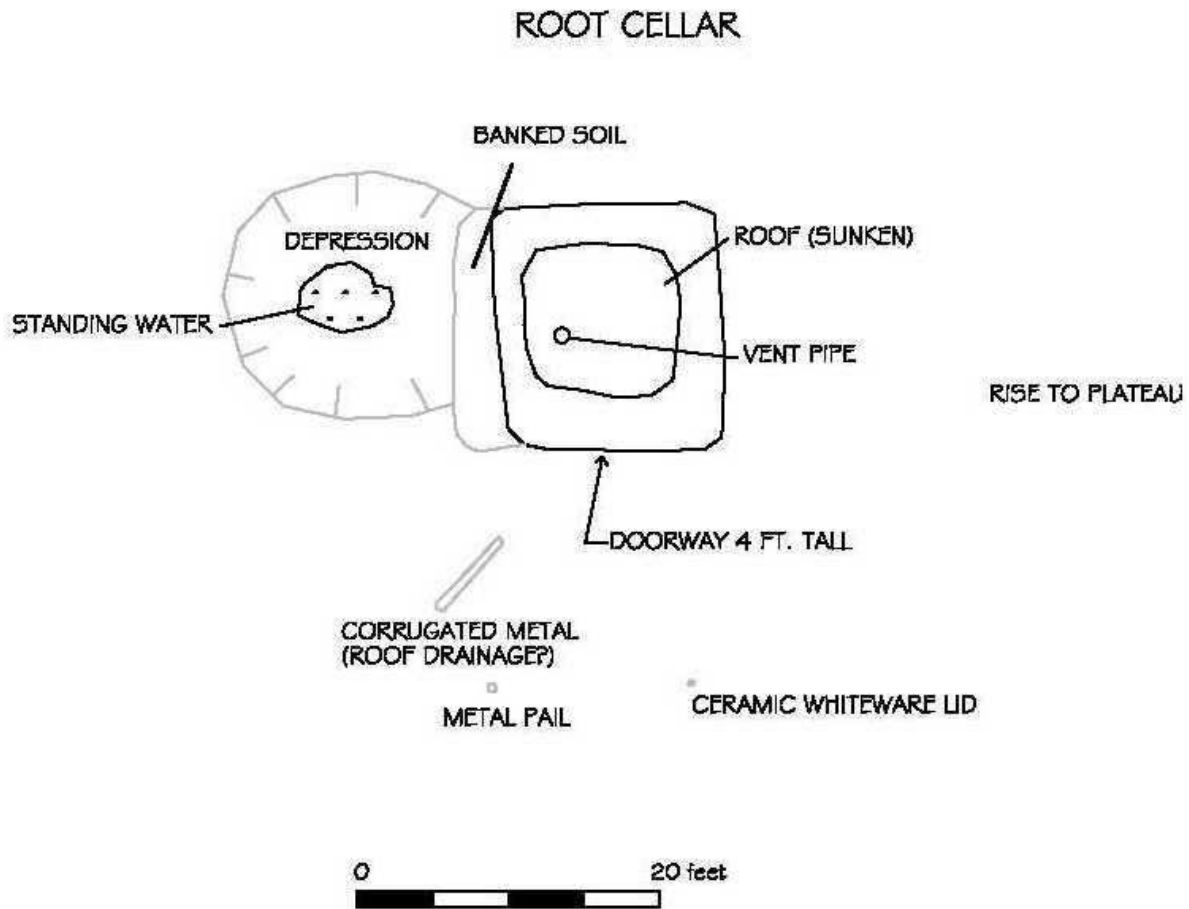


Figure 137. Root house.

### Alternative II

The 100-foot fire perimeter described for Alternative I is also included in Alternative II. Additionally, remove brush and trees from the west edge of the clearing to reestablish the historic arc of the lighthouse beacon. The limits of the area within which removal of brush and trees will occur will be determined by extending a line along compass bearings from the lighthouse tower corresponding to the historic arc of the light. To the south, the line will extend along a bearing of approximately 145 degrees. To the north, the line will extend along a bearing of approximately 340 degrees. West of these lines, remove all trees and any brush more than four feet in height. This will reestablish the historic arc of the navigation light, but will not reestablish the entire area occupied by the historic station clearing. Roughly, the cleared area will extend 560 feet to the north and 360 feet to the south of the station tramway.

### Alternative III

Under Alternative III, restore the clearing to its historical dimensions, using the 1910 'Detailed Description of Premises' map and ca.1940 aerial photographs to establish the clearing edges. The limits of the rehabilitated clearing would be roughly located at points 560 feet north of the station

tramway, 360 feet south of the tramway, and 260 feet northeast of the southeast corner of the barn. Within this area, remove all trees greater than two inches dbh and brush more than four feet in height. Monitor the thinning and timing of thinning due to the threat of Red Pine Pocket Decline.<sup>8</sup>

Alternative III calls for maintenance of the reestablished clearing through a program of cyclical prescribed burns. Reintroduction of a fire regime within the clearing requires preparation of a Fire Management Plan, in accordance with NPS Director's Order 18 (NPS 1998) and the 2001 Federal Wildland Fire Management Policies, which state that every National Park with burnable vegetation must update their existing fire plan. Fire plans are considered adaptive management, where decisions based on current science and management are continually adjusted.

Prescribed fire is any fire intentionally ignited to meet specific land management objectives under predetermined and approved conditions. The purpose of using this management tool is to maintain the cultural landscape and landscape features within specific target conditions. For Raspberry Island, the target conditions are spatial rehabilitation of the clearing and definition of the visual sweep of the light in order to enhance the interpretive value of the site. Low intensity fire can help maintain a meadow, scenic vista areas, cultural landscapes, and discourage invasion by non-native plants. Since the cessation of active management of the clearing in 1957, vegetation has obscured much of this historic landscape feature. The area has suffered a significant loss of integrity and no longer provides visual opportunities for interpretation.

Pretreatment for prescribed burns may include mechanical removal of trees (usually trees with more than six inches dbh), large shrubs, and snags to help keep fire within the designated area. Removal of ladder fuels prior to burning significantly reduces the risk of uncontrolled burning and increases the ability of fire fighters to control the burn. In addition, because it is unclear how knotweed reacts to a fire regime, pretreatment should include chemical treatment of the weed weeks prior to a burn.

For several years, the Keepers' logs note a nearly annual fire regime. However, this frequent schedule of burning prepared the space for agricultural purposes and was not intended to preserve the sweep of the light. The land had to be clean of all woody material so that it could be plowed. Under Alternative III, the historic frequency of burning would not be used, since the area will not be plowed for agricultural purposes. The proposed action is intended to reestablish the spatial dimensions of the clearing to facilitate interpretation of this feature and its relationship to the operation of the light and the lives of the station's residents. As a result, the woody vegetation may be allowed to regenerate to a height of four feet, reducing the frequency of burns to once every three to five years.

The recommended low intensity burn will offer environmental benefits for the site. Low intensity burns leave a patchwork of thatch behind that bind the soil surface, reducing runoff and erosion. Organic matter in the soil will increase nutrient levels through decomposition of burned material. Air quality is minimally affected by correctly managed prescribed burning.

---

<sup>8</sup> Red Pocket decline was first noted in Wisconsin in 1975, but has recently greatly increased in occurrence. Research indicates a connection between *Dendroctonus valens* and *Leptographium* spp., the timed thinning of red pine, and the spread of the disease. As a preventative measure, avoid thinning red pine during the late spring. For further information, refer to [www.na.fs.fed.us](http://www.na.fs.fed.us) and [www.dnr.state.wi.us](http://www.dnr.state.wi.us).

It is important to understand that this site is grassland created by human intervention in the landscape, not an area of native prairie. Rehabilitation of the clearing, therefore, refers to rehabilitation of a cultural landscape element, not reestablishment of a native ecosystem. The proposed action emphasizes the introduction of plant species that are native to the region, tolerant of fire, and extant on the island, after introduction of the fire regime.

To determine what native species occupied the clearing after removal of the native forest and the subsequent fire regimes, native forests were mapped from GLO records of 1832 to 1866.<sup>9</sup> These records indicate that original vegetation included sugar maple, white and yellow birch, aspen, and white and red pine. In general, Wisconsin prairie plant diversity in this habitat type and at this early stage of succession would have included lilies, sedges, composites, buttercups, ferns and grasses.<sup>10</sup>

Native species present on the island have been identified by the NPS and several are suitable for establishment in the clearing. The park inventory, USDA Forest Services' Fire Effects Information Database (FEIS)<sup>11</sup> and *Plant Species Composition of Wisconsin Prairies*<sup>12</sup> were consulted to determine what plant material would be appropriate for inclusion in the reestablished clearing community and which species would have an increased chance of establishing on their own if a fire regime was reintroduced. Effort has been made to recommend species that are native to the region and present on the island; however, non-native species that were purposefully introduced as forage crops during the historic era have also been noted (Table 10).

Table 10. Native Species Present

Native Species Present	Reaction to Fire
<b>Lilies</b>	
Bluebead-lily ( <i>Clintonia borealis</i> )	Tolerates low intensity burns
<b>Sedge</b>	
Three-way sedge ( <i>Dulichium arundinaceum</i> )	
Rush ( <i>Juncus</i> sp.)	
Sedge ( <i>Carex</i> sp.)	
<b>Composites</b>	

<sup>9</sup> [www.ncrs.fs.fed.us/gla/histveg/](http://www.ncrs.fs.fed.us/gla/histveg/)

<sup>10</sup> [www.dnr.state.wi.us](http://www.dnr.state.wi.us)

<sup>11</sup> [www.fs.fed.us/database/feis/index.html](http://www.fs.fed.us/database/feis/index.html) provides the access to FEIS.

<sup>12</sup> *Plant Species Composition of Wisconsin Prairies: An Aid to Selecting Species for Plantings and Restorations Based Upon University of Wisconsin-Madison Plant Ecology Laboratory Data*, Technical Bulletin No. 188, Department of Natural Resources, 1998. This text focuses on species native to prairies that occur predominantly in southern Wisconsin; however, Bayfield County prairies are included in the bulletin.

Table 10. Native Species Present

Native Species Present	Reaction to Fire
Fleabane ( <i>Erigeron sp.</i> )	
Canada hawkweed ( <i>Hieracium kalmii</i> )	
Field pussy-toes ( <i>Antennaria neodioica</i> )	Tolerates low intensity burns
Pearly everlasting ( <i>Anaphalis margaritacea</i> )	
Yarrow ( <i>Achillea millefolium</i> )	Tolerates low intensity burns
Aster ( <i>Aster sp.</i> )	Fire tolerant
Canada goldenrod ( <i>Solidago canadensis</i> )	Fire tolerant
Early goldenrod ( <i>Solidago juncea</i> )	Fire tolerant
Goldenrod ( <i>Solidago sp.</i> )	Fire tolerant
<b>Buttercups</b>	
Buttercup ( <i>Ranunculus sp.</i> )	
<b>Ferns</b>	
Bracken fern ( <i>Pteridium aquilinum</i> )	Fire tolerant
<b>Grasses</b>	
Bluejoint ( <i>Calamagrostis canadensis</i> )	Fire tolerant
Wooly panic grass ( <i>Panicum lanuginosum</i> )	
Fowl meadow-grass ( <i>Poa palustris</i> )	
Wild oat-grass ( <i>Danthonia spicata</i> )	Fire tolerant
Common hairgrass ( <i>Deschampsia flexuosa</i> )	
Slender wheat-grass ( <i>Agropyron trachycaulum</i> )	
Hairgrass ( <i>Agrostis scabra</i> )	Fire tolerant
Cow-wheat ( <i>Melampyrum lineare</i> )	
Canada wild-rye ( <i>Elymus canadensis</i> )	Likes summer fire
Cotton grass ( <i>Eriophorum sp.</i> )	Fire tolerant
<b>Forage Crops</b>	
Timothy ( <i>Phleum pratense</i> )* non-native	Controlled by fire during growth

Table 10. Native Species Present

Native Species Present	Reaction to Fire
	period

The following table list plants native to the region, present on the island, and tolerant of fire ecology. These species are not representative of a native prairie community; however, they could be utilized in this rehabilitated cultural setting.

Table 11. Native Species Present But Not Endemic of Native Prairie

Native species present but not endemic of native prairie
Hairy capmoss ( <i>Polytrichum sp.</i> )
Twinflower ( <i>Linnaea borealis</i> )
Wood strawberry ( <i>Fragaria vesca</i> )
Wild strawberry ( <i>Fragaria virginiana</i> )
Fireweed ( <i>Epilobium angustifolium</i> )
Bastard-toadflax ( <i>Comandra umbellata</i> )
Thistle ( <i>Cirsium sp.</i> )
Harebell ( <i>Campanula rotundifolia</i> )
Dogbane ( <i>Apocynum androsaemifolium</i> )
Sweet cicely ( <i>Osmorhiza sp.</i> )
Wild oats/sessile bellwort ( <i>Uvularia sessilifolia</i> )
Wooly panicum ( <i>Dichanthelium acuminatum</i> )

The low vegetative buffer historically present at the edge of the clearing near the lighthouse yard will be reestablished and maintained. This will create a pattern of treatment that reflects past practices and protects the bluff and forest edges.





## Chapter 6: Bibliography

- Birnbaum, Charles A. and Christine Capella Peters. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. Washington DC: NPS, 1996.
- Black, Vicki, Karen Lindquist, and Lori Heinsohn. "A Naturalist's Guide to the Raspberry Island Sandspit Trail." Bayfield, WI: Apostle Islands National Lakeshore, 1981. Manuscript on file at National Park Service, Denver Service Center.
- Clark, Victor S. *History of Manufactures in the United States*. 3 vols. New York: Peter Smith, 1949.
- Cochrane, Theodore S. and Hugh H. Iltis. *Atlas of the Wisconsin Prairie and Savanna Flora*. Technical Bulletin 191. Madison, WI: Department of Natural Resources, 2000.
- Cooper, David J., Megan A. Partlow, Bradley A. Rodgers, Gregory T. Smith, and Gordon P. Watts, Jr. *By Fire, Storm, and Ice: Underwater Archeological Investigations in the Apostle Islands*. 2nd ed. rev. Madison, WI: State Historical Society of Wisconsin, 1996.
- Cronon, William. "An Eclectic Chronology of Apostles Islands Lighthouse History." Bayfield, WI: Cultural Resources - Plans, Apostle Islands National Lakeshore Library, n.d.
- \_\_\_\_\_. *Nature's Metropolis: Chicago and the Great West*, New York: W.W. Norton & Co., 1991.
- Curtis, John T. *The Vegetation of Wisconsin: An Ordination of Plant Communities*. Madison, WI: University of Wisconsin Press, 1959.
- Department of Natural Resources. *Plant Species Composition of Wisconsin Prairies: An Aid to Selecting Species for Plantings and Restorations Based Upon University of Wisconsin-Madison Plant Ecology Laboratory Data*, Technical Bulletin No. 188, 1998.
- Danziger, Edmund Jefferson Jr. *The Chippewas of Lake Superior*. Norman, OK: University of Oklahoma Press, 1979.
- Dobie, Richard W. *The Vegetation Ecology of Raspberry, Rocky and York Islands, Apostle Islands National Lakeshore, Wisconsin*, MS Thesis, Michigan Technical University, 1977.
- Durocher, Evelyn (Lutz). "Interview with Kate Lidfors." 19 August 1980. Transcription on file at Apostle Island National Lakeshore Library, Bayfield, WI.
- Fischer, William C. *Planning and Evaluating Prescribed Fires: A Standard Procedure*. Ogden, UT: US Department of Agriculture, 1978.
- Great Lakes Indian Fish and Wildlife Commission. *A Guide to Understanding Ojibwe Treaty Rights*. Odanah, WI: Great Lakes Indian Fish & Wildlife Commission, 2002.
- Henderson, Richard. *Plant Species Composition of Wisconsin Prairies: An Aid to Selecting Species for Plantings and Restorations Based Upon University of Wisconsin-Madison Plant Ecology Laboratory Data*. Technical Bulletin 188. Madison, WI: Department of Natural Resources, 1995.

- Henderson, Richard, and Sandra H. Statz. *Bibliography of Fire Effects and Related Literature: Applicable to the Ecosystems and Species of Wisconsin*. Technical Bulletin 187. Madison, WI: Department of Natural Resources, 1995.
- Hoffman, Randy and Kelly Kearns, ed., *Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants*, Department of Natural Resources, Madison, Wisconsin, 1997.
- Holland, F. Ross, Jr. *Great American Lighthouses*. New York: John Wiley & Sons, 1994.
- Judziewicz, Emmet J. and Rudy G. Koch. "Flora and Vegetation of the Apostle Islands National Lakeshore and Madeline Island, Ashland and Bayfield Counties, Wisconsin". *The Michigan Botanist*. 32:2 (1993).
- Männikkö, Nancy Farm and Robert W. Mackreth. "Apostle Islands Light Stations National Historic Landmark Nomination," n.d., Draft.
- Meinig, D.W. *The Shaping of America: A Geographical Perspective on 500 Years of History, Volume 3: Transcontinental America, 1850-1915*, New Haven, CT: Yale University Press, 1998.
- National Park Service. *Annual Report of the Lighthouse Board, 1885-1910*. Electronic abstract file transcribed by Terry Pepper, 2001. On file at Apostle Island National Lakeshore Library, Bayfield, WI.
- \_\_\_\_\_. *Annual Report of the Lighthouse Board, Raspberry Island Lighthouse Logbook, 1872-1939* Transcription on file at Apostle Island National Lakeshore Library, Bayfield, WI.
- \_\_\_\_\_. *The Ashland Press*. Selected articles, 1872. On file at Apostle Islands National Lakeshore Library, Bayfield, WI.
- \_\_\_\_\_. *The Bayfield Press*. Selected articles, 1870-1885. On file at Apostle Islands National Lakeshore Library, Bayfield, WI.
- \_\_\_\_\_. *The Bayfield County Press*. Selected articles, 1882-1885. On file at Apostles Islands National Lakeshore Library, Bayfield WI.
- \_\_\_\_\_. *Historic Lighthouse Preservation Handbook*, Washington, DC: National Park Service, 1997.
- \_\_\_\_\_. Jacker Diary, *Annual Report of the Lighthouse Board*, n.p., On file at Apostle Island National Lakeshore Library, Bayfield, WI, 1895.
- \_\_\_\_\_. *Marjorie Benton Interview*, On file at Apostle Islands National Lakeshore Library, Bayfield, WI, 1989.
- \_\_\_\_\_. National Register Bulletin: *How to Apply the National Register Criteria for Evaluation*, Washington, DC, 1998.
- \_\_\_\_\_. 9th Light-House District, "Description of Buildings, Premises, Equipment, Etc., at Raspberry Island Light-Station, Wisconsin." Typescript on file at Apostle Islands National Lakeshore Library, Bayfield, WI.

- \_\_\_\_\_. *Notice to Mariners, No. 97*. On file at Apostle Islands National Lakeshore Library, Bayfield, WI.
- \_\_\_\_\_. N.F. Parker, handwritten notes. On file at Apostle Islands National Lakeshore Library, Bayfield, WI.
- \_\_\_\_\_. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*, Washington DC: Government Printing Office, 1995.
- \_\_\_\_\_. *Wildland and Prescribed Fire Management Policy: Implementation Procedures Reference Guide*, Washington, DC: National Park Service, 1998.
- Page, Robert, Cathy Gilbert, and Susan Dolan. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques*. Washington, DC: National Park Service, 1998.
- Parnes, Herschel L. D. "Apostle Islands Lighthouses National Register Nomination." 1997. On file at Apostle Island National Lakeshore Library, Bayfield, WI and Wisconsin State Historic Preservation Office, Madison, WI.
- Perala, Donald A. *Quaking Aspen Productivity Recovers After Repeated Prescribed Fire*. St. Paul, MN: US Department of Agriculture, 1995.
- Perala, Donald and David Alban. *Allometric Biomass Estimators for Aspen-Dominated Ecosystems in the Upper Great Lakes*. St. Paul, MN: US Department of Agriculture, 1994.
- Quinn Evans Architects. *Historic Structure Report: Raspberry Island Lighthouse*, n.p., 2000. On file at Apostle Island National Lakeshore Library, Bayfield, WI.
- Rakestraw, Lawrence, D. J. Frederick, C. R. Eder. R. A. Van Dyke, and B. J. Griewe, "Original Forest Vegetation and Land Use History of the Apostle Islands National Lakeshore," Proceedings of the First Conference for Scientific Research in the National Parks, 1976, On file: Denver Service Center.
- Rathbun, Peter A. "Special History Study: Light Stations of the Apostle Islands National Lakeshore," draft, 1988, On file at Apostle Island National Lakeshore Library.
- Ross, Hamilton Nelson. *La Pointe. Village Outpost on Madeline Island*, Madison: State Historical Society of Wisconsin, 2000.
- Snyder, David. *Historic Structure Report, Raspberry Island Lighthouse*, MSS on file at Apostle Islands Lakeshore Library, Bayfield, WI. Taylor, Jonathan Golding. *Environmental Education Effects on Perception of Recreational and Scenic Qualities of Forest Burn Areas*. MA Thesis. Ann Arbor, MI: University of Michigan, 1982.
- United States Code, Public Law 91-424, Washington DC, September 26, 1970.
- US Department of Agriculture. *Fire Prescription for a Healthy Environment*. Provo, UT: US Department of Agriculture, 1998.
- \_\_\_\_\_. *Land Management Considerations in Fire-Adapted Ecosystems: Conceptual Guidelines*. Washington, DC: US Department of Agriculture, 1996.

- \_\_\_\_\_. *Prescribed Fire*, Washington, DC: Government Printing Office, 1985.
- \_\_\_\_\_. *Wildland and Prescribed Fire Management Policy: Implementation Procedures Reference Guide*, Washington, DC: US Department of Agriculture, 1998.
- \_\_\_\_\_. *Wildland Fire in Ecosystems: Effects of Fire on Flora*. Washington, DC: US Department of Agriculture, December 2000.
- \_\_\_\_\_. *Wildland Fires in Ecosystems: Effects of Fire on Air*. Washington, DC: US Department of Agriculture, December 2002.
- Wallace, David H. *Historic Furnishings Report: Raspberry Island Light Station, Apostle Islands National Lakeshore, Bayfield, Wisconsin*. Harper's Ferry, WV: National Park Service, 1989.
- Washington State Department of Natural Resources. *Annual Summary of Prescribed Burning Activities Conducted Under Washington Smoke Management*. Olympia, WA: Washington State Department of Natural Resources, 1981.

## Drawings

- Raspberry Island Light Station, Wis., Drawing No 633-80013, On file: DSC TIC.
- Drawing No. 633-80022, "As Constructed, Raspberry Island Water System," 1982, On file: NPS TIC.
- U.S. Coast Guard, "Raspberry Island Light Station – Boat House As-Built", October 1943, On file at Apostle Islands National Lakeshore Library, Bayfield, WI.

## Web Sites

- [www.cr.nps.gov/history/online\\_books/nps28/28chap7.htm](http://www.cr.nps.gov/history/online_books/nps28/28chap7.htm). National Park Service, *NPS- 28: Cultural Resource Management Guideline*
- [www.ebparks.org/fire/rxfire/round\\_valley\\_03](http://www.ebparks.org/fire/rxfire/round_valley_03)
- [www.epa.gov](http://www.epa.gov)-Environmental Protection Agency.
- [www.ext.vt.edu](http://www.ext.vt.edu)- Virginia cooperative Extension, A handbook for Forest Vegetation Management in Recreation and Historic Parks.
- [www.dnr.state.wi.us](http://www.dnr.state.wi.us)- Wisconsin Department of Natural Resources.
- [www.ncrs.fs.fed.us/gla/histveg/](http://www.ncrs.fs.fed.us/gla/histveg/)
- [www.npwrc.usgs.gov](http://www.npwrc.usgs.gov)- Northern Prairie Wildlife Restoration Center Guide for Wisconsin.
- [www.nps.gov/seki/fire/pdf/po\\_fe99/pdf](http://www.nps.gov/seki/fire/pdf/po_fe99/pdf)
- [www.na.fs.fed.us](http://www.na.fs.fed.us)- Department of Agriculture, Forest Service.
- [www.redding.com/specials/rxfire](http://www.redding.com/specials/rxfire)



## For Further Reading and Research

- National Park Service. National Register Bulletin #34, *Guidelines for Evaluating and Documenting Historic Aids to Navigation*.
- \_\_\_\_\_. Cultural Resource Management, Vol. 20, No. 8, Keeping Lighthouses, 1997.
- Pauly, Wayne. *How to Manage Small Prairie Fires*. Madison, WI: Dane County Parks, 1998.
- Riveredge Nature Center. *Begin With a Seed: Riveredge Guide to Growing Wisconsin Prairie Plants*. Newburg, WI : Riveredge Nature Center, 1999.
- Sinton Gerling, Heather, Michael G. Willoughby, Andrew Schoepf, Clare Thomas, and Kathy Tannas. *Wisconsin Prairie Plants: A Guide to Using Native Plants on Disturbed Lands*. Alberta Agriculture, Food and Rural Development, Edmonton, Canada, 1996.
- Welsh, James Forrest. *Pattern of Change in the Plant Community Composition of a Restored Prairie in Wisconsin*, Thesis (M.S.), University of Wisconsin, Madison, 1993.



**Appendix**  
**Environmental Assessment**  
**Raspberry Island Light Station**



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 1.0 PURPOSE AND NEED

The National Park Service (NPS) proposes to develop a landscape treatment plan for the Raspberry Island Light Station that is consistent with current and planned restoration and rehabilitation efforts of the existing historic structures and which maximizes the overall historic interpretive value of the light station. Development and implementation of the Cultural Landscape Report (CLR) would advance the Raspberry Island Light Station Management Philosophy as developed by the National Park Service (NPS, 1989), which also proposes rehabilitation of the lighthouse to enhance its interpretive value. The *Raspberry Island Lighthouse Historic Structure Report* (Quinn Evans, 2002) provides specific recommendations for adapting the north half of the lighthouse as NPS employee housing, and the interior of the south half (the Head Keeper's quarters) to its 1915 to 1920 appearance. With the exterior of the lighthouse remaining essentially unchanged since 1906, it is the desire of the NPS to insure that landscape treatments complement the overall interpretive theme of the light station. This would include minimizing visual intrusions from the installation of any new utility systems or other modern facilities.

The need to develop the CLR is based on a requirement to maintain light station structures and their landscape in perpetuity in as historically accurate a context as possible for the benefit of current and future generations as required by the enabling legislation establishing Apostle Islands National Lakeshore (Public Law 91-424). Without an agreed-upon approach to this long-term requirement, NPS risks ad hoc and potentially incompatible decisions being made over time, which would eventually lead to a degradation of the historical integrity of the light station. In addition, the NPS agreed to develop the Raspberry Island Light Station CLR as a stipulation of a March 30, 2001, Memorandum of Agreement with the State Historical Society of Wisconsin allowing implementation of erosion control measures on the bluff in front of the light station. A final environmental assessment and a finding of no significant impact addressing erosion control at the Raspberry Island Light Station were developed and approved in September 2001 (NPS, 2001). Construction of an erosion control revetment in front of the light station was completed in 2002.

Regardless of the details developed in the CLR, the following overarching requirements must be met:

- The minimal level of treatment must preserve the Apostle Islands light stations.
- The existing Coast Guard-operated light must be incorporated into the preservation plan for the Raspberry Island Light Station.
- The portion of the island outside the historical clearing will be managed as "wilderness."

This EA addresses the reasonable and feasible alternatives including the preferred alternative (landscape treatment) described in Part II of this CLR. This environmental analysis is in compliance with the requirements of the National Environmental Policy Act (NEPA) of 1969 and NPS Director's Order #12 (*Conservation Planning, Environmental Impact Analysis, and Decision Making*), and Handbook.



**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

## 2.0 BACKGROUND

### 2.1 Project Background and Scope

Apostle Islands National Lakeshore was established September 26, 1970, by Public Law 91-424. This enabling legislation charges the National Park Service (NPS) with conserving and developing geographic, scenic, scientific, and historic resources of 21 of the 22 Apostle Islands National Lakeshore and a segment of the mainland lakeshore of northern Wisconsin for inspiration, education, recreational use, and public enjoyment.

The park contains significant natural, cultural, scenic, and recreational resources, stands of northern hardwood forest, colonial bird nesting areas, unique landscapes, and over 70 structures listed in the National Register of Historic Places (NPS, 1987). Among these cultural resources is the largest collection of light stations in the National Park System.

Automated lights that have replaced the original lights at the light stations are still important to Lake Superior shipping and navigation. Responsibility for maintaining and preserving the light stations was transferred from the U.S. Coast Guard to the NPS by Public Law 99-497. The Coast Guard continues to be responsible for the modern navigational lights.

The Apostle Islands National Lakeshore's Statement for Management, approved June 15, 1993, directs the NPS to preserve and maintain historic structures, landscapes, and artifacts to prescribed treatment levels at National Register sites. Preservation of cultural resource assets is also required in the park's General Management Plan draft (NPS, 1989). Specific goals for maintaining and improving the cultural resources within the park are also identified in the park's Annual Performance Plan (NPS, 2003).

Raspberry Island (296 acres) was set aside as a lighthouse reservation in 1859. The lighthouse was constructed in 1862, first lit in 1863, and remodeled into its present tri-plex configuration in 1906. It was originally staffed and occupied by civilian keepers employed by the United States Lighthouse Service. United States Coast Guard personnel lived in and attended the station during its final years as an occupied light station, 1939 to 1947.

Subsequent to closure of the light station in 1947, it was vacant for approximately ten years until it was leased by the Coast Guard to an architectural firm in Minneapolis. Ellerbee Architects used the main building as a corporate retreat from 1958 to 1975. During this time a number of cosmetic changes were made to the interiors of the lighthouse and several other light station buildings by Ellerbee caretakers. Raspberry Island, with its light station, was later transferred to the Bureau of Land Management (BLM). One of the earliest references in the park files to Raspberry Island is a 1974 letter from Chief Ranger Douglas Barnard, Apostle Islands National Lakeshore, to the Lands Office, Midwest Region. The letter stated Raspberry Island was owned by the BLM and expressed concern about the present permit holders who were making alterations and repairs to a historic structure.

The National Park Service took possession of Raspberry Island in late 1975. A historic site survey was initiated and conducted by the State Historical Society of Wisconsin in August 1975. The surveyor filled out Classified Structure Field Inventory Forms for each building on Raspberry Island. From that survey, a nomination was prepared to the National Register of Historic Places. The thematic nomination included all the Apostle Islands Light Stations except La Pointe (Long Island). The nomination was titled "Apostle Islands Lighthouses" and was entered onto the Register on March 8, 1977.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

Apostle Islands National Lakeshore staff, assisted by professional historical architects from the Midwest Regional Office began to stabilize the buildings in the latter 1970s and early 1980s. Some of the work accomplished included:

- Removing asbestos shingles that had covered the original metal roofing
- Repainting of buildings and the lighthouse roof to historic color schemes
- Major lighthouse foundation repairs and waterproofing
- Installation of drainage tiles
- Installation of a potable water system drawing water from Lake Superior
- Approximate restoration of gardens to their 1920s-era appearance

The historic light station garden restoration was initiated in 1982 by the park historian and was based on oral history interviews and documentation from historical photographs. Subsequent to re-establishment of the gardens, a park employee was assigned to Raspberry Island to maintain the structures and utility systems, and to plant and maintain the gardens.

The overall appearance of the Raspberry Island Light Station facilities has changed little since about 1906. A major exception to this is the loss through natural re-vegetation of the original 4-acre lighthouse clearing (Quinn Evans, 2000). The 4-acre clearing was necessary to provide adequate visibility from the lake during lighthouse operations. After abandonment of the light station in 1947, this cleared area was allowed to naturally revegetate, and has become a brushy, wooded area obscuring the light station from much of the historic view from the lake.

The most recent and extensive NPS work impacting the Raspberry Island Light Station was the installation of a rubblemound revetment extending along the shoreline northwest from the existing light station dock approximately 240 feet and southeast of the existing dock approximately 100 feet. The revetment extends approximately nine feet up from the toe of the slope and approximately 25 feet lakeward from the toe of the slope before angling into the water over an additional 25 to 30 feet and ending in about 3 to 4 feet of water. Construction of the revetment, the addition of fill, and revegetation of the slopes associated with the 40-foot bluffs adjacent to the light station was necessary to halt erosion and stabilize the steep slopes before continuing erosion and mass wasting threatened the structural integrity of light station facilities (NPS, 2001)

Regarding the historical development of the Raspberry Island Light Station cultural landscape, the density of development and land use corresponds to three spatial zones:

1. The roughly 2-acre area within the fence corresponding to the light station complex and immediate vicinity, where the planted lawns and flower beds were maintained on a routine basis.
2. The area outside the fence, corresponding to the historical clearing (4 acres), where the forest canopy was removed to enhance the visibility of the light and for other activities such as hay and grain crop production and livestock grazing. This area might also include the two trails leading from the building cluster, and
3. The remainder of the outlying island area, which was minimally disturbed and used for wood cutting and natural resource harvesting. This area would be continued to be managed as “wilderness.”

The light station complex and the historical clearing are the focus of the CLR. The rest of the island, which will continue to be managed as “wilderness,” is excluded from consideration in the CLR. Additionally, the island’s sand spit located approximately three quarters of a mile east of the light station is also excluded from CLR consideration. The sand spit was the location of a

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

boathouse and dock between 1862 and 1893. This area served as the primary boat landing location for the island prior to construction of a dock at the base of the bluff in front of the lighthouse. Although the sand spit remains an alternative landing site and remains connected to the light station by a trail, there are no remaining historic structures at the site.

### 2.2 Relationship to Other Actions and Plans

The most prominent action recently completed and impacting the cultural landscape of the Raspberry Island Light Station is the erosion control work along the bluff in front of the light station (NPS, 2001). The installation of a shoreline rubblemound revetment, addition of fill to the bluff slopes, and revegetation of the reconfigured/stabilized slope has changed the historic view of the light station from the lake. These changes will be permanent and are treated as such in this EA addressing cultural landscape treatments.

The various rehabilitation efforts being planned for the lighthouse and detailed in the Historic Structure Report (Quinn Evans, 2000) only indirectly impact the cultural landscape from the standpoint of the potential siting of externally visible utility system components such as solar panels, aboveground piping, storage tanks, etc. The functional, operational, and economic considerations associated with the selection of specific approaches to establishing or improving utility services at the light station documented in several feasibility studies and a Choosing-by-Advantages process (Arcadis, 2003).

In accordance with NPS *Management Policies* (Section 6.2, 2001), the park has also been conducting a wilderness review of all Apostle Islands National Lakeshore land areas to determine eligibility for wilderness designation under provisions of the 1964 Wilderness Act. The Apostle Islands National Lakeshore *Wilderness Study and Environmental Impact Statement* was finalized and released in 2004 (NPS, 2004). Most of the land area of Raspberry Island, which was set aside as a Lighthouse Reserve as part of the light station establishment in 1859, is managed as wilderness with the exception of the light station and surrounding environs. These developed light station areas do not meet the Wilderness Act criteria since they are major visitor attractions with many signs of people. The excluded areas include the historic clearings around the Raspberry Island Light Station, which is considered part of the cultural landscape.

### 2.3 Issues

Issues related to the development of the CLR and selection of a preferred alternative to landscape treatment were initially identified through internal and external scoping involving NPS staff, contract personnel, agency personnel, and the general public. Additional issue areas were identified through the NPS Value Analysis process conducted May 14, 2003. Specific issue areas addressed in developing the CLR and selecting the preferred alternative (treatment or combination of treatments) include the need to:

- Define the historic boundaries of the light station and the varying levels of historic human activity within each boundary,
- Record the present history and evaluate the landscape's existing physical condition and integrity,
- Determine how the landscape has changed over time, particularly with regard to the effect of vegetation changes upon the historical integrity of the light station complex. This is especially important in the areas cleared to provide visibility to passing ships,
- Determine whether additional research is required for restoration and maintenance of the light station gardens,

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

- Determine how landscape treatment can complement restoration of the lighthouse while accommodating necessary utilities and visitor and staff amenities,
- Provide a range of schematic alternatives with a preferred treatment alternative recommended including specific guidance and life cycle cost estimates for implementing and maintaining the treatment alternatives whether they be preservation, restoration, reconstruction, rehabilitation, or any combination of these as defined by the Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, and
- Conduct an environmental analysis of identified feasible alternative approaches to the long-term management of the light station cultural landscape.

### 2.4 Impact Topics

General activities associated with the proposed action (implementation of CLR recommendations) broadly include changes in landscape plantings and other elements, clearing of some additional forest edge areas surrounding the light station, and changes in grounds maintenance activities. The sections below define, in general terms, those resource and issue areas that will be taken forward for analysis of the proposed action and those areas found to be irrelevant to the proposed action.

#### 2.4.1 Impact Topics Selected for Analysis

##### 2.4.1.1 Geology, Soils, Topography

Subsurface geology, soil types, and topography influence native vegetative cover and the success or failure of horticultural varieties of plant materials currently or historically existing on the landscape. These impact areas also come into play in determining the impacts of changing the exposure of surface soils to precipitation as would be the case in re-establishing the historic clearing.

##### 2.4.1.2 Visitor Experience

Visitors come to the Raspberry Island Light Station to experience the sights, sounds, and smells of a bygone era. All actions taken by the NPS at the light station, including landscape treatments, either contribute to or detract from the overall visitor experience.

##### 2.4.1.3 Park Operations

Preservation, restoration, and/or rehabilitation of the cultural landscape of the Raspberry Island Light Station would require sustained input in terms of NPS staffing, labor, equipment, and capital. Long-term levels of landscape maintenance associated with selected treatments and treatment levels are of particular importance in terms of impact on park operations.



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 2.4.1.4 Ecological Resources

Cultural landscape treatments would impact horticultural practices within the central building cluster area of the light station. Treatments selected for the historically cleared areas adjacent to the light station would impact native and introduced plant species that characterize the successional vegetative community in these areas, which could include several rare or special interest species. Ecotone areas such as the historically cleared area, which is now reverting to forest, often have relatively high biodiversity and can be important feeding and breeding habitat for bird and other animal species. Plant palettes for restoration efforts must avoid the use of known or potential invasive species.

### 2.4.1.5 Cultural Resources

The cultural landscape and proposed future treatments is the focus of this environmental analysis process. The built environment that characterizes the light station is an obviously important feature of the overall cultural landscape. This includes not only the exterior conditions and finishes of the structures but also how they interact with the surrounding matrix of horticultural plantings and plant communities.

Activities such as digging to install plant materials as well as activities such as tree and brush clearing/bush-hogging, etc. have the potential to disturb archeological resources.

## 2.4.2 Impact Topics Eliminated from Further Consideration

### 2.4.2.1 Surface Water Quality

Changes in the amount of cleared area, type of vegetative cover, etc. could change the absorptive capacity of the soil and erosion rates thus impacting near shore (littoral) surface water quality through increased sediment loading. However, these changes would be very temporal in nature—associated with significant storm events—and would be of such generally low intensity as to not be detectable from existing natural erosion processes.

### 2.4.2.2 Floodplains and Wetlands

Under NPS final procedures for implementing Executive Order 11988 “Floodplain Management” and 11990, Protection of Wetlands, “actions that are functionally dependent on water are excepted from compliance with these orders. Furthermore, floodplains and wetlands do not exist within the project area on Raspberry Island (Van Stappen, personal communication).

### 2.4.2.3 Prime and Unique Farmland

There is no prime or unique farmland located anywhere on Raspberry Island. Except for the limited domestic gardening historically conducted on the grounds of the light station along with few head of livestock historically maintained by lightkeepers, there has never been any substantial agricultural production on Raspberry Island.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

#### 2.4.2.4 Regional Air Quality

Except for the possible necessity of burning some cut trees and brush removed from the historically cleared areas adjacent to the light station, none of the possible landscape treatments would generate any noticeable air emissions. If cut vegetation were burned, any smoke from the one-time burning of cut vegetation would result in only minor, short-term and local impacts.

#### 2.4.2.5 Solid Wastes and Hazardous Materials

Except for possible generation of some vegetation wastes, cultural landscape treatments would not be expected to generate solid wastes or hazardous materials. Plan notes on any construction drawings would direct contractors to notify NPS personnel should any unknown hazardous materials or wastes be encountered during any phase of construction. Appropriate remedial actions would be developed should such materials be encountered.

#### 2.4.2.6 Transportation

There would be no changes to existing water access, trails, or ferry service associated with development and implementation of the CLR.

#### 2.4.2.7 Environmental Justice

Under a policy established by the Secretary of the Interior, to comply with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, departmental agencies should identify and evaluate, during the scoping and/or planning processes, any anticipated effects, direct or indirect, from the proposed project or action on minority and low-income populations and communities, including the equity of the distribution of the benefits and risks.

Members of the Red Cliff and Bad River Bands of Lake Superior Chippewa Indians have reservation lands in the vicinity of the Apostle Islands National Lakeshore and tribal representatives have been included in early coordination and scoping (see Section 6.0). Indirect regional socioeconomic impacts of the various alternatives, would be minimal if any, and would be similar for these or other minority populations as for the regional population at large.

#### 2.4.2.8 Socioeconomics

Raspberry Island Light Station is the centerpiece of light station interpretation within the park, it is seasonally served by a concessionaire ferry, and is, therefore, an important component of the local tourist industry. However, despite any improvements in interpretive value resulting from cultural landscape treatments; any increase in visitor interest related to changes in the light station landscape conditions would be extremely difficult to quantify, and would have a negligible impact on the overall regional economy. Short-term construction activities associated with cultural landscape treatments would likewise be negligible in terms of the regional economy. For these reasons, socioeconomics is dismissed as an impact topic.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

#### 2.4.2.9 Indian Trust Lands

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

The island is not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources were dismissed as an impact topic.

#### 2.4.2.10 Ethnographic Resources

Tribal representatives of the Red Cliff and Bad River Bands of Lake Superior Chippewa have been included in early coordination (see Section 6.0). The nature of any of the possible cultural landscape treatments within the developed light station grounds is such that there would be no direct or indirect impact on tribal members or their lands.

#### 2.4.2.11 Museum Collections

Actions concerning the cultural landscape would have no impact on the curation of museum items associated with lighthouse operations on Raspberry Island. Items identified as part of the historical landscape will be preserved in place rather than removed and placed in a museum collection.

#### 2.4.2.12 Soundscape Management

In accordance with National Park Service *Management Policies* (2001) and Director's Order #47, *Sound Preservation and Noise Management*, an important part of the National Park Service mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and duration of human-caused sound considered acceptable varies among National Park Service units depending upon the level of surrounding development.

Any construction equipment used in landscape work and the long-term operation of the light station would result in human-caused sound; however, the noise impacts from construction operations would only last during construction. Following construction activities the island would revert back to its existing ambient soundscape; therefore soundscape management was dismissed as an impact topic. If a functioning fog signal were re-established as part of long-range restoration efforts at the light station, the sound would be a component of the historic interpretation of the site.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 2.4.2.13 Lightscape Management

In accordance with National Park Service *Management Policies* (2001), the National Park Service strives to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human-caused light. Any construction activities associated with landscape work would take place primarily during daylight hours and would not call for any additional, permanent lighting on Raspberry Island. Lights within the restored lighthouse would be minimal, and would be designed to not interfere with views of the night sky or impact the adjacent “wilderness” areas. Additionally, should the navigational light be re-positioned in the lighthouse tower, it would be a component of the historic interpretation of the site. Therefore, lightscape management was dismissed as an impact topic.

## 2.5 Applicable Regulatory Requirements and Coordination

This EA has been prepared to evaluate the impacts of the reasonable alternatives described in Section 3.0. The EA is prepared in accordance with the *National Park Service’s Director’s Order No. 12: Conservation Planning, Environmental Impact Analysis, and Decision-Making*, and its accompanying Handbook, and the provisions of the National Environmental Policy Act of 1969 (NEPA) (PL 91-190, 42 USC 4321-4247). Detailed procedures for developing this document comply with the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508).

Regulatory requirements and guidance, which may be applicable to the activities addressed in this EA, include:

- National Historic Preservation Act Section 106 addressing any activities directly or indirectly impacting prehistoric or historic archeological sites, historic structures, or cultural landscapes eligible for or listed on the National Register of Historic Places.
- National Parks Omnibus Management Act of 1995.
- National Park Service Organic Act of 1916.
- Apostle Islands National Lakeshore enabling legislation (Public Law 91-424).
- Coastal Zone Management Act Section 307 requiring a consistency determination through Wisconsin’s coastal zone management program.
- Wisconsin Shoreland Management Program (WAC Chap. NR 115).
- Endangered Species Act Section 7.
- Secretary of the Interior’s Standards for the Treatment of Historic Properties (1995) and Guidelines for the Treatment of Cultural Landscapes (1996).
- NPS Management Policies 2001.
- NPS Director’s Order 28: Cultural Resources Management Guidelines.
- Uniform Federal Accessibility Standards (UFAS) or the Americans with Disabilities Act Accessibility Guidelines (ADAAG), whichever provides greater accessibility without compromising the physical condition or integrity of the historic light station landscape.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 3.0 ALTERNATIVES

Three cultural landscape treatment alternatives (alternatives) for the Raspberry Island Light Station areas are presented in Part II, Chapter 5 of the Raspberry Island Light Station CLR. One of the three alternatives is the No-Action Alternative, which is required by the National Environmental Policy Act. The No-Action Alternative forms the basis from which all action alternatives are evaluated. The overall treatment approach proposed for the light station, described in Chapter 5 of the CLR, is rehabilitation. As part of the action alternatives, select non-extant site elements can be recreated to facilitate interpretation within the light station yard. Alternatives II and III also provide two different maintenance regimes for implementing the rehabilitation treatment in the historically cleared area outside the light station yard. All alternatives evaluated in the CLR are listed below. Refer to Part II, Chapter 5 of the CLR for more detailed discussion of the three alternatives.

#### 3.1 Action Common to All Alternatives

All alternatives, including the No-Action Alternative would include the establishment of a defensible fire perimeter extending out approximately 100 feet from the building cluster. In the case of Alternative III this defensible fire perimeter would be subsumed into a more broadly cleared area. The defensible fire perimeter would be cleared and maintained free of all trees six inches in diameter base height (dbh) or greater and all brush more than four feet high. Existing trails within this area would be maintained as at present.

#### 3.1 Alternative I—No-Action Alternative

The No-Action Alternative would require the fewest changes to the existing landscape, and generally, it preserves the current conditions at Raspberry Island. This alternative would result in preservation of existing forms and materials through immediate stabilization, ongoing preservation maintenance, and repair of historic materials and features. Historic small-scale features in the landscape, pedestrian circulation; lawn and gardens, and historic clearing would be preserved through on-going maintenance. The existing views from the lighthouse yard to the lake would be preserved and maintained. The light station complex would continue to be the principal focus of preservation, maintenance, and interpretation efforts (Figure 127 in the CLR).

Annual costs for implementing this alternative are estimated at approximately \$4,290 per year (this estimate includes normal operating costs for grounds maintenance of the existing landscape plus annual mowing of the fire perimeter). There would be initial costs associated with establishing the 100-foot defensible fire perimeter that would total an estimated \$11,000.

See Part II, Chapter 5, page 154 of the CLR for a more detailed discussion of this alternative.

#### 3.2 Alternative II—Rehabilitate and Restore Targeted Landscape Elements to the Period of Interpretation (Preferred Alternative)

Alternative II would rehabilitate the light station complex, the yard immediately surrounding the light station, and a portion of the historically cleared area in a manner compatible with the period of interpretation (1902 to 1947). Elements of the landscape that have been removed in the past such as fencing around the building cluster would be reconstructed. The gardens would be rehabilitated or restored and pedestrian circulation would be restored to historic parameters. Small-scale features of the light station that do not date from the period of interpretation would be removed, while missing items, such as the flagstaffs, birdbath, and range markers would be

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

restored. In addition to clearing the defensible fire perimeter, the historic arc of the lighthouse beacon would be restored by clearing. Restoration of this area would entail clearing all 6-inch dbh or greater trees and all brush taller than four feet west of a compass bearing of 145 degrees extending southeast from the lighthouse tower and west of a compass bearing 340 degrees extending north/northwest from the lighthouse tower. Clearing in this area would extend from the indicated compass bearings all the way to the island's western bluff along the lake (Figure 128 in the CLR). The clearing would be maintained by periodic mowing. Alternative II provides for visual continuity between the proposed period of interpretation for the rehabilitated light house and the light house yard by rehabilitating contributing landscape elements associated with this period and through a program of selective reconstruction of significant, non-extant landscape elements.

Annual costs for implementing this alternative are estimated at approximately \$4,430 per year (this estimate includes normal operating costs for grounds maintenance of the existing landscape plus annual mowing of the cleared areas). There would be initial costs associated with establishing the 100-foot defensible fire perimeter and clearing vegetation within the historic arc of the lighthouse beacon that would total an estimated \$18,000.

See Part II, Chapter 5, page 159 of the CLR for detailed discussion of this alternative.

### **3.3 Alternative III—Rehabilitate the Historic Spatial Relationships of the Clearing, Establish a Mosaic of Native Plants that have the Visual Character of the Historic Period**

As in Alternative II, the light station area would be preserved and maintained in a manner compatible with the period of interpretation. The difference between Alternative III and Alternative II is that with Alternative III the entire historic clearing would be restored through initial complete removal of trees and brush (Figure 130 in the CLR). Long-term maintenance of the cleared area would be accomplished using occasional prescribed burns to minimize encroachment of woody vegetation. Regional native species of grasses and forbs would be established in the historic clearing. The low-intensity prescribed burning to minimize the encroachment of woody species would restore the historic visual aspects of cyclic controlled fire, and enhance the ecological function of the clearing. Prescribed burns would occur only once every four or five years. The lakeshore would need to develop an approved Fire Management Plan for Raspberry Island, in accordance with the NPS Director's Order 18 and the 2001 Federal Wildland Fire Management Policies, before the prescribed burning program could begin.

Annual costs for implementing this alternative are estimated at approximately \$4270 per year (this estimate includes normal operating costs for grounds maintenance of the existing landscape plus annual mowing of the cleared area). There would be an initial cost associated with re-establishing the 4-acre historic clearing that would be an estimated \$15,000.

See Part II, Chapter 5, page 165 of the CLR for detailed discussion of this alternative.



## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

#### 3.4 Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "...the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101." Using the six criteria from Section 101 detailed below, it was determined that Alternative II—Rehabilitate and Restore Targeted Elements to the Period of Interpretation, provides the greatest level of protection of resources of the alternatives evaluated in this EA. The rationale for this determination is provided for each criterion in the following discussion.

***Criterion 1—Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.*** Alternative II best fulfills this criterion by only clearing a portion of the historically cleared area. The historic view of the lake and island from the light station and of the light station from the lake is maintained for future generations, yet the effort required by park staff is minimized as is long-term cost. This alternative would maintain the light station structures and its landscape in perpetuity as a historically accurate example of architecture and uses of a working light station from the period 1906 to 1947. The No-Action Alternative would minimally preserve the light station complex and would place the light station in jeopardy of further degradation in the future. Alternative III would preserve the light station complex, but would remove more of the encroaching natural habitat surrounding the light station that has become an important ecotonal habitat for a number of species. Alternative III would also require more park resources to maintain in the long term than would Alternative II.

***Criterion 2—Assure for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings.*** Implementation of the preferred alternative would ensure that park actions are consistent with the current and planned rehabilitation efforts, as well as maximizing the overall historic interpretive value of the light station. The preferred alternative also calls for some small-scale restoration work at the light station. This alternative, in conjunction with the previously completed erosion control improvements along the bluff in front of the light station, would also provide visitors with an appropriate context in which to view the light station for many generations to come. The preferred alternative also allows the some of the forest edge (ecotonal) habitat to remain as a productive and important part of Raspberry Island ecology. Even though this was not part of what was essentially an "industrial-type" light station landscape, it has become a part of the environmental context of the light station over the years. Alternative III would remove all of this edge habitat from the island reducing ecological diversity and, in the eyes of some, reducing the visual aesthetics of the light station surroundings. The No-Action Alternative would maintain all of the existing edge habitat; however, this alternative would also only minimally preserve the light station, which could lead to aesthetically unpleasing and even unsafe conditions in the future.

***Criterion 3—Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.*** The preferred alternative would maintain use of the light station and its associated buildings in such a way that it would enhance the existing, developed portion of the light station and maintain a portion of the historically cleared area that would be both accessible to visitors and manageable for park staff. Alternative II would preserve some existing forest edge habitat of ecological value and which would also be more efficient in absorbing precipitation than would be maintained lawn or grassy areas. The No-Action Alternative would allow the historically cleared area to continue to revert to forest. Eventually, this could potentially interfere with visitors' understanding of a culturally accurate representation of the light station complex and its historic functioning. Additionally, the No-Action Alternative would allow structural

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

degradation of some historic landscape elements to continue. While Alternative III would also preserve the light station complex, it would totally remove forest edge habitat. This could have adverse consequences for certain species of wildlife and would have the potential to increase runoff and associated localized erosion.

***Criterion 4—Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.*** Again, the preferred alternative would preserve the light station complex in such a way that the existing environment would be enhanced, and it would support a wider diversity of species in the historically cleared area than would Alternative III. Yet, the area could still be managed with current park staffing levels and would provide visitors with a reasonably accurate understanding of the historic clearings importance in terms of lighthouse visibility. This alternative would allow visitors to experience both a historically accurate light station and a more complex ecological area in the immediate area. The No-Action Alternative would not present as accurate a depiction of a working light station as Alternative II or III, and Alternative III would not preserve forest edge habitat as would Alternative II.

***Criterion 5—Achieve a balance between population and resource use that will permit high standards of living and wide sharing of life's amenities.*** The preferred alternative provides the best balance between maintaining the diverse ecological functions of the island and the park service's charge to preserve and present an accurate representation of the historic light station as it was in the period between 1906 and 1947. The No-Action Alternative falls short of adequately rehabilitating and maintaining the historic landscape elements associated with the light station and Alternative III, while accurately rehabilitating and restoring historic landscape elements, does so at the expense of eliminating all forest edge habitat and potentially increasing surface water runoff and localized erosion. Alternative III also requires a maximum input of park resources to maintain rehabilitated and restored landscape elements.

***Criterion 6—Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.*** Plant materials within the cultural landscape of the light station are renewable resources, which would be most enhanced through implementation of either Alternatives II or III since the No-Action Alternative minimizes rehabilitative efforts regarding landscape plant materials. While not as aspect of recycling, reduced use of fossil fuels associated with less intense grounds maintenance efforts characterizing Alternative II make this alternative preferable to Alternative III regarding non-renewable resources.

### 3.5 Mitigating Measures

If previously unknown, and significant archeological resources are unearthed during construction, work would be stopped in the area of discovery and the NPS would consult with the Wisconsin State Historic Preservation Office (SHPO) and as appropriate, the Advisory Council on Historic Preservation. If impacts to significant resources could not be avoided by redesign, mitigating measures would be developed in consultation with the SHPO to help ensure that the informational significance of the sites would be preserved. If appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990 would be implemented.

## **CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT RASPBERRY ISLAND LIGHT STATION**

---

### **3.6 Alternatives Considered But Dismissed**

A dismissed alternative that included recommendations for management of the forested area, which constitutes all areas of Raspberry Island outside of the light station area was considered. Although the forested areas of Apostle Islands National Lakeshore have not yet been officially designated wilderness, these areas will continue to be managed as “de facto” wilderness areas. The forested area is considered to be part of the Wilderness Plan and will be managed as such in future planning efforts.

### **3.7 Alternative Impact Comparison Matrix**

An impact comparison matrix is provided in Table 1.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

<b>Table 1</b> <b>Impact Comparison Matrix</b>			
<b>Resource Area</b>	<b>Alternative I No Action Alternative</b>	<b>Alternative II</b>	<b>Alternative III</b>
Geology, Soils, and Topography	The No-Action Alternative would have no individual impacts, but a cumulative, long-term, minor, beneficial impact on geology, soils, and topography would ensue from the previously completed erosion control project.	Implementation of this alternative would result in individual short-term and long-term, negligible, adverse impacts from minimal land disturbance during rehabilitation and restoration work including partial vegetation removal in the historic clearing. Cumulative impacts from Alternative II on soil erosion potential would be long-term, moderate, and beneficial primarily associated with the previously completed erosion control project.	Individually, this alternative would have short-term and long-term, minor, adverse impacts on soil erosion potential in the vicinity of the light station. However, this alternative would have a long-term, minor beneficial impact on soil fertility levels. Cumulatively, Alternative III would have long-term, moderate, beneficial impacts on soil erosion potential in the vicinity of the light station, again, primarily as a result of the previously completed erosion control work.
Visitor Use and Experience	Individually, the No-Action Alternative would result in long-term, moderate adverse impacts to the visitor experience at Raspberry Island. Cumulative impacts from other actions including lighthouse rehabilitation would be long-term, minor, and beneficial to visitor experience in spite of this No-Action Alternative.	Alternative II would have an individual, short-term, negligible adverse impact on visitor experience due to disruptions during implementation; however the long-term impacts would be moderate and beneficial. The cumulative impacts associated with the erosion control project and exterior and interior rehabilitation of the lighthouse and associated buildings would add to the beneficial impacts of Alternative II, providing an overall long-term, moderate, beneficial impact on visitor experience.	Alternative III would have an individual short-term, minor, adverse impact on visitor experience while the landscape improvements were being implemented. Once the initial work was completed, this alternative would result in long-term, moderate, beneficial impacts on visitor experience at the Raspberry Island Light Station. Cumulative impacts would also be long-term, moderate, and beneficial to visitor experience.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

<b>Table 1</b> <b>Impact Comparison Matrix</b>			
<b>Resource Area</b>	<b>Alternative I No Action Alternative</b>	<b>Alternative II</b>	<b>Alternative III</b>
Park Operations	Individually, this alternative would result in long-term, negligible, adverse impacts to park operations. Cumulatively, this alternative would have a long-term, minor, adverse impact on the custodial/maintenance workload of park employees. However, there would be a cumulative, long-term, moderate, beneficial impact on the quality of life of seasonal on-island employees from living quarters improvements and utility improvements.	This alternative would have both individual and cumulative, long-term, minor, adverse impacts on park operations by placing additional duties on existing full-time custodial/maintenance staff and on seasonal, on-island staff. There would be a cumulative, long-term, moderate, beneficial impact on seasonal staff quality of life as a result of improved living quarters.	Alternative III would have an individual and cumulative long-term, moderate, adverse impact on park custodial and maintenance operations. However, there would be a cumulative, long-term, moderate, beneficial impact on seasonal staff quality of life as a result of improved living quarters and utility systems.
Ecological Resources	Individually the No-Action Alternative would have a long-term, negligible, beneficial impact on ecological resources on Raspberry Island by allowing the stages of natural succession in the forest edge area to continue. Cumulatively, and mainly as a result of the completed erosion control efforts along the bluff in front of the light station, this alternative would have a long-term, negligible, adverse impact on ecological resources.	Individually, Alternative II would have a long-term, minor, adverse impact on ecological resources on Raspberry Island. Cumulatively, this alternative would have a long-term, negligible, adverse impact on ecological resources on Raspberry Island.	Individually and cumulatively, Alternative III would have a long-term, moderate adverse impact on ecological resources on Raspberry Island.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

Table 1 Impact Comparison Matrix			
Resource Area	Alternative I No Action Alternative	Alternative II	Alternative III
Cultural Resources	Taking no-action would result in individual, long-term, moderate adverse impacts to the cultural landscape at Raspberry Island. This would be due to allowing the forest to continue to succeed in the historically cleared areas and continuation of minimal preservation efforts. Cumulative impacts would be long-term, minor, and beneficial.	Alternative II would result in individual and cumulative, long-term, moderate beneficial impacts to light station cultural resources.	Alternative III would result in individual and cumulative, long-term, moderate beneficial impacts to light station cultural resources.



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 4.0 AFFECTED ENVIRONMENT

Topics addressed in this section and subsequently analyzed in Section 5.0 (Environmental Consequences) were selected based on their relevance as indicated by on-site visits, secondary source documents, regulatory agency input, and information from NPS personnel. The rationale for selection or non-selection of impact topics is provided in Section 2.4 and 2.5.

#### 4.1 Geology, Soils, and Topography

Raspberry Island and the surrounding area is part of the Mid-Continental Rift Geologic Province. The Apostle Islands National Lakeshore is underlain by three sandstone formations of the 2,600 foot thick Bayfield group (NPS, 1987). The Great Lakes region, including Lake Superior, were sculpted by repeated glaciation with the last glacier (Wisconsinan) retreating some 12,000 years ago. The Apostle Islands were primarily formed from glacial till overlying the sandstone bedrock. The highest area on each island is usually on the north side as a result of glacial movement from northeast to the southwest. Erosion caused by wave action on the toe of slopes has resulted in development of steep banks on the north sides of most of the islands. These banks are composed of mixtures of clay, silty sand, and sandstone. As wave action removes sediment from the base of the slopes, the strength of the material above is insufficient to maintain stability resulting in slumping and slides, which combined with rill and sheetwash, cause continuing retreat of the bluff face (Mickelson and Edil, 1984).

According to the Wisconsin Department of Natural Resources, the Bayfield Peninsula areas (including the Apostle Islands) has highly erodible red clay soils, and any land/land development that disturbs these soils or the soil cover can contribute to severe erosion (WDNR website). The soils in the immediate vicinity of the lighthouse are classified as Portwing-Herbster complex (NRCS, 2003). This soil complex formed in clayey till and in the underlying loamy and sandy stratified lacustrine deposits. The complex includes approximately 10 inches of silt loam, which overlays 10-55 inches of silty clay loam. The bottom layer of this soil complex is approximately 55-80 inches of sandy and silty loam. Permeability is slow in the clay loam and clay layers. Bluff erosion on relatively flat islands like Raspberry is a result of the combined undercutting by wave and ice action, followed by slumping through sheet and rill erosion on the bluff face, and through gravity induced slope processes (Cary et. al., 1979). As was determined in studies prior to the erosion control efforts in front of Raspberry Island, surface runoff from lawn and maintained areas within the light station grounds contributed to the bluff erosion process.

The mean lake level within the park is 602 ft. The topography of the Apostle Islands is low rolling with the highest point being 1,081 feet above mean sea level on Oak Island. Record high lake levels during the mid-1980s increased the rates of erosion on all of the islands. Lake Superior levels are currently below the long-term average. A relatively shallow water area (shoal) surrounds most of Raspberry Island. Marina Shoal extends approximately ½ mile south of the island. Water depths of 20 feet or less extend outward ¼ mile from the island in this area. Beyond the shoals, water depths of 80 to over 120 feet are common.

The bluff in front of the light station was stabilized by installation of a rubblemound revetment, slope recontouring, and revegetation in 2001 (NPS, 2001). As a result, erosion of this formerly unstable bluff no longer presents a hazard to the integrity of light station structures, and the landscape modifications made as part of this stabilization effort are considered part of existing conditions and permanent in nature.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 4.2 Visitor Use and Experience

The Wisconsin Department of Tourism has consistently named Bayfield County as one of the top ten Wisconsin travel destinations. An estimated 70 million dollars was spent by tourists in Bayfield County in 1998 (WDT, 1999).

Visitor numbers have remained steady over the past few years. The table below contains the visitor numbers for all of the Apostle Islands National Lakeshore, visitors to the Headquarters, and visitors to Raspberry Island. The numbers of visitors to Raspberry Island who arrived by ferry and those who arrived independently are presented in Table 2.

Table 2 Visitation at Raspberry Island					
Year	Total Visitation	Headquarters	Raspberry Island		
			By Ferry	Individuals	Total
2000	182, 814	24,413	3,602	3,112	6,714
2001	195, 377	22,248	4,400	3,642	8,042
2002	170,726	23,409	3,060	3,457	6,517
2003	170,337	20, 862	2,492	2,932	5,424
<b>Source:</b> Apostle Islands National Lakeshore, 2004.					

The majority of visitors to the Apostle Islands National Lakeshore live in Wisconsin and Minnesota (especially the Twin Cities) with Illinois (Chicago area) a distant third.

In keeping with the General Management Plan (GMP) emphasis on visitation to the inner islands, Raspberry Island is a focal point for the light station interpretive program at the park. The NPS staffs the light station with an interpreter during the summer when the light station buildings are open to the public. The island is served by a commercial cruise boat concession with twice-a-day service between mid-June and early September. The proximity of the dock facilities to the light station complex and the location of the island near the mainland make the Raspberry Island Light Station one of the most accessible light stations within the Apostle Islands National Lakeshore. Commercial shuttle service to Raspberry Island is also available through the end of September during the annual Apostle Islands Lighthouse Celebration.

Typically, two-thirds of the visitors to the park reach the islands with their own watercraft. Being an inner island with a protected mooring area and easy island access, many boaters anchor off of Raspberry Island for overnight stays. The NPS conducts boat counts each day during the main tourist season.

In addition to summer tourist season visitors, the NPS also sponsors several educational programs within the Apostle Islands National Lakeshore for school-age children. Of these various programs, the Lighthouse Curriculum program is the only one focused on Raspberry Island. This is a program for 4th and 5th grade students involving day-trips to Raspberry and other islands during late May and early June (NPS, 1999). Another program, Apostle Islands School, is held during mid-May for 5th, 6th, and 7th graders and includes overnight stays on selected islands (sometimes including Raspberry).

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

Besides the light station complex, there is also a short hiking trail on Raspberry Island and limited picnicking facilities. The hiking trail connects the light station complex with the sand spit on the south side of the island. Camping is not permitted on Raspberry Island.

#### 4.3 Park Operations

Each season the NPS has staff housed at Raspberry Island from mid-June until the end of September. The staff usually consists of 1 to 2 park interpreter positions. These park employees reside on the island seven days a week for the entire season. The focus of park staff at Raspberry Island revolves around interpretive, custodial, and grounds maintenance. All administrative duties pertaining to Raspberry Island are handled out of the Apostle Islands National Lakeshore Headquarters in Bayfield, WI. During the winter months (October to May) the buildings and docks are secured for the winter and there are no staff or maintenance responsibilities on the island.

Staff responsibilities include dock repair, groundskeeping, custodial duties (including maintaining and pumping the vault toilet), management of the water system and propane system, and minor trail maintenance. These responsibilities are in addition to the interpretative duties on the island. Currently the grounds-keeping duties take, on average, one day per week to complete. There are some additional duties required of park staff when opening and closing the park. In addition to the park staff, a volunteer group, composed of local 4H members, is transported to the island on a weekly basis to maintain the gardens on the island.

#### 4.4 Ecological Resources

##### 4.4.1 Vegetation

Floristically the archipelago is part of the hemlock/white pine/northern hardwoods forest, with a few boreal and sub-arctic elements (NPS, 1987). Of the 809 plant species found in the vicinity of the Apostle Islands National Lakeshore, one is federally listed and 35 species are state listed. There are four state endangered plant species, nine state threatened and 22 species of concern within the Apostle Islands National Lakeshore. As a result of historic logging activities, many of the island forests are dominated by white birch (*Betula papyrifera*), yellow birch (*Betula lutea*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), balsam fir (*Abies balsamea*), and white cedar (*Thuja occidentalis*) with limited stands of white pine and hemlock (NPS, 1987). A comprehensive discussion of Apostle Islands National Lakeshore flora is provided in the publication by Judziewicz and Koch (1993).

Raspberry Island has a flora comprised of 266 species (Judziewicz and Koch, 1993). There was never extensive logging since the entire island was designated as a government lighthouse reserve in 1864 in order to insure an adequate supply of wood for the lighthouse keeper and staff. White cedar, balsam fir, and white and yellow birch dominate the forest. Canada yew (*Taxus canadensis*) dominates the understory since deer have never been present on the island (Judziewicz and Koch, 1993). Mountain maple (*Acer spicatum*), beak hazelnut (*Corylus cornuta*), and red-berried elder (*Sambucus pubens*) are also common in the understory. There is a diverse exotic plant and weed flora around the light station complex (Dobie, 1977). Native herbaceous species common near the more open wooded area surrounding the light station complex include lady fern, dwarf ginseng, rosy twisted-stalk, white mandarin, nodding trillium, spikenard, false Solomon's seal, and buttercups (*Ranunculus* spp.). Raspberry Island's 273 undisturbed acres are included in Wisconsin Department of Natural Resources' Apostle Islands Maritime Forests State Natural Areas (WDNR website)

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

Detailed discussion of the common plants in the light station yard is presented in Part I, Chapter 3 (beginning on page 88) in the CLR. Appendix A of this EA contains a list of common plants found in the vicinity of the light station.

#### 4.4.2 Wildlife

A number of mammals, the largest being the black bear, are known to occur on Raspberry Island. Those mammals known to occur on Raspberry Island are listed in Table 3. Because of the absence of deer browse, the understory plant community, dominated by Canada yew (*Taxus canadensis*), is maintained and represents a vegetative community that has nearly been extirpated from the mainland.

Table 3 Mammals of Raspberry Island	
Common Name	Scientific Name
Black Bear	<i>Ursus americanus</i>
Coyote	<i>Canis latrans thamnus</i>
Little Brown Bat	<i>Myotis lucifugus lucifugus</i>
Masked Shrew	<i>Sorex cinereus cinereus</i>
Meadow Vole	<i>Microtus pennsylvanicus pennsylvanicus</i>
Red Fox	<i>Vulpes fulva fulva</i>
Red Squirrel	<i>Tamiasciurus hudsonicus minnesota</i>
Red-Backed Vole	<i>Clethrionomys gapperi gapperi</i>
Snowshoe Hare	<i>Lepus americanus</i>
<b>Source:</b> Apostle Islands National Lakeshore, 2001.	

There are 149 species of breeding birds from the Apostle Islands (Smith and Van Stappen, 1999). Patzoldt (cited in Van Stappen and Kovar, 1987a) observed 85 bird species on Raspberry Island. Temple and Harris reported 61 breeding species on the island in 1977 (breeding bird surveys conducted annually since 1990 have recorded 66 species on Raspberry Island). The most abundant species include chimney swift, red-breasted nuthatch, tree swallow, winter wren, parula warbler, black-throated green warbler, ovenbird, and white-throated sparrow (Patzoldt cited in Van Stappen and Kovar, 1987a). A list of frequently seen birds on and around Raspberry Island is given in Appendix B.

There is no known historical or current eagle nesting on Raspberry Island. The state-threatened Cooper's hawk (*Accipiter cooperii*) is a fairly common spring migrant and breeds in low numbers on some of the Apostle Islands. However, nesting has not been observed on Raspberry Island.

#### 4.4.3 Aquatic Wildlife

Amphibians recorded from Raspberry Island include four-toed salamander (*Hemidactylium scutatum*), red-backed salamander (*Plethodon cinereus cinereus*), American toad (*Bufo americanus*), and spring peeper (*Hyla crucifer crucifer*). The garter snake (*Thamnophis sirtalis sirtalis*) was the only reptile reported by Patzoldt.

Terrestrial invertebrate populations on Raspberry Island have not been studied in detail.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

Aquatic macrobenthic invertebrate populations found in the waters surrounding the Apostle Islands including Raspberry Island are similar to those throughout the Great Lakes (Hiltunen, 1969). Zooplankton assemblages reflect warmer near shore waters and colder offshore waters. Benthic density and diversity is low in many areas because of bottom scour between islands. However, these organisms are a vitally important part of the food chain for fish species inhabiting the waters of the Apostle Islands National Lakeshore.

Past surveys of aquatic invertebrates in waters within the Apostle Islands National Lakeshore found the amphipod, *Pontoporeia affinis*, as the most abundant macroinvertebrate (Rose, 1988). Midge larvae (*Chironomidae*) were the second most abundant invertebrate group in the shallower waters. Clams belonging to the families Sphaeriidae and snails in the families Planorbidae and Lymnaeidae were also relatively common. Larvae of biting midges (*Ceratopogonidae*) were abundant locally. Other insect taxonomic groups represented in the samples included *Ephemeridae* and *Baetiscidae* (mayflies), *Hydropsychidae*, *Limnephilidae*, and *Molanidae* (caddisflies), and *Empididae* (danceflies). Other non-insect groups included *Asellidae* (isopods) *Tubificidae* (oligochaetes), and *Hirudinea* (leeches) (Rose, 1988).

A list of fish species common to the waters of Apostle Islands National Lakeshore is given in Appendix C. Seasonal and permanent fish refuges in the vicinity of the Apostle Islands National Lakeshore are important in maintaining populations of whitefish, herring, and lake trout.

## 4.5 Cultural Resources

### 4.5.1 Archeological Resources

The NPS Archeological Sites Management Inventory System (ASMIS) base indicates that 52 archeological sites have been recorded to NPS standards at Apostle Islands National Lakeshore.

Raspberry Island was surveyed in the summer of 1975 (Salzer and Overstreet, 1976). In spite of the intensive survey coverage and placement of strata pits on the sand spit on the southeast corner of this island, no archeological sites were encountered with the exception of a single flake found via shovel testing technique in the northeast side of this island unit (Salzer and Overstreet, 1976).

Previous investigators have noted that despite a good deal of archeological research (including surveys, testing and extensive data recovery studies), most investigations to date have yielded few temporally diagnostic artifacts (Noble, 1993; Richner, 1987). Noble (1990) monitored structural investigations of the Raspberry Island lighthouse performed by Quinn Evans Architects, and he also shovel tested along the bluff edge in advance of the stabilization project (Noble, 2000). The latter could be cited as additional investigations on the subject island and also as a minor project carried out after 1997. Only small surveys of limited scope have been undertaken since 1997, resulting in the discovery of no additional sites.

Historic archeological resources at Raspberry Island Light Station are discussed in Part I, Chapter 3 (beginning on page 99) of the CLR.

# **CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**

## **RASPBERRY ISLAND LIGHT STATION**

---

### **4.5.2 Cultural Landscape**

The cultural landscape at Raspberry Island Light Station is described in full in Part I, Chapters 2 and 3 in the CLR.



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 5.0 ENVIRONMENTAL CONSEQUENCES

This section of the EA forms the scientific and analytic basis for the comparisons of alternatives as required by 40 CFR 1502.14. This discussion of impacts (effects) is organized in parallel with Section 4.0 (Affected Environment) and is organized by resource areas. The No-Action Alternative and each action alternative are discussed within each resource area. To the extent possible, the direct, indirect, short-term, long-term, beneficial, and adverse impacts of each alternative are described for each resource area.

**Intensity, Duration, and Type of Impact**—Evaluation of alternatives takes into account whether the impacts would be negligible, minor, moderate, or major (negligible being detectable only with special equipment or observation techniques, minor being barely detectable to casual observers, moderate being clearly detectable, and major being a substantial alteration of historic conditions evident to any observer). Duration of impacts is evaluated based on the short-term or long-term nature of alternative-associated changes on existing conditions. Type of impact refers to the beneficial or adverse consequences of implementing a given alternative. More exact interpretations of intensity, duration, and type of impact are given for each resource area examined. Professional judgment is used to reach reasonable conclusions as to the intensity and duration of potential impacts.

**Cumulative Impacts**—The CEQ regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and proposed action alternatives.

Cumulative impacts were determined by combining the impacts of the proposed alternative with potential other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or foreseeable future projects within Apostle Islands National Lakeshore and, if necessary, the surrounding region. Reasonably foreseeable cumulative actions include:

- **Raspberry Island Lighthouse Restoration**—The Historic Structure Report, Raspberry Island Lighthouse (Historic Structure 08-103A) (Quinn Evans, 2000) calls for preservation, architectural restoration, and the contemporary use of the Raspberry Island Lighthouse, which includes rehabilitation of the north half of the lighthouse for use as NPS seasonal staff living quarters and the interior of the south half (the Head Keeper’s quarters) to its 1915 to 1920 appearance. Utility upgrades necessary to adequately support NPS seasonal staff residing in the planned rehabilitated north half of the lighthouse are detailed below.

The planned partial restoration of the lighthouse building interior along with other planned interior facility improvements entail the installation of new or upgraded electrical, water, and wastewater utility systems to support both NPS staff operations and visitors to the island. The types of systems have been determined through various engineering feasibility studies and reviews through the Choosing-by-Advantages process (ARCADIS, 2003; 2004).

The feasibility studies undertaken by ARCADIS have led to the proposed installation of a new septic system including septic tank, pump, and leach field; drilling of a potable water well; and installation of photovoltaic arrays in the vicinity of the light station. The new septic system would be an entirely subsurface system with the leach field located in the forest edge area approximately 150 feet northeast of the lighthouse. The potable water well

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

would be located behind the ranger cottage and would have few visible aboveground elements. The photovoltaic project is currently in design development. The current design calls for eight (8) photovoltaic (PV) panels, each measuring approximately two feet in width by four feet in height. These would be arranged in either a single row, approximately sixteen feet long, or in two rows each approximately eight feet long. Current plans call for location of the array east of the ranger cottage. The array would be oriented towards the south and elevated towards the sun. Operationally, the PV array must remain in the immediate vicinity of the light station since power loss is substantial over longer transmission distances.

The ranger cottage area within the light station building cluster already contains non-historic service elements—the water tank and propane tank, which are not readily visible from the lake, the top of the tramway, or the top of the lighthouse. The orientation of the cells toward the south will minimize reflection off the cells for visitors within the lighthouse yard or approaching the station dock by boat.

In addition to the PV array, the system would require batteries, a generator, and controls. Several options are being discussed for the location of these elements with the most likely location inside a portion of the fog signal building.

- **Shoreline Erosion Control**—The recent installation of a shoreline rubblemound revetment, addition of fill to the bluff slopes, and revegetation of the reconfigured/stabilized slope has changed the historic view of the light station from the lake. These changes are permanent and were addressed in the Erosion Control at Raspberry Island Light Station Final Environmental Assessment, (Woolpert 2001).

**Impairment Analysis**—The *National Park Service Management Policies* (NPS, 2001a) requires analysis of potential effects to determine whether or not actions would impair park resources or values.

The fundamental purpose of NPS, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values; and, the park's enabling legislation, as amended, further mandates resource protection. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable, actions that would adversely affect park resources and values.

These laws give NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values. Although Congress has given NPS the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. Impairment may result from NPS activities in managing the park, from visitor activities, or from activities undertaken by concessionaires, contractors, and others operating in the park. Impairment of park resources can also occur from activities occurring outside park boundaries. An impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park.
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park.
- Identified as a goal in the park's GMP or other relevant NPS planning documents.

### 5.1 Geology, Soils, and Topography

#### 5.1.1 Methodology

Impact analysis focused on the extent of soil exposure and disturbance, which could change erosion rates both on the gently sloping upland areas as well as along the existing unstabilized bluff faces adjacent to the light station's newly constructed revetment.

**Basis of Analysis**—The impact analysis is discussed in terms of initial acreage of surface disturbance and probable long-term changes in grounds maintenance activities.

#### **Intensity, Duration, and Type of Impact:**

- **Negligible**—Small changes in the amount of annually disturbed soils and no perceptible changes in soil structure confined to the existing developed areas of the light station complex.
- **Minor**—Small changes, that would be either stabilize or destabilize the soil structure, would be found in the amount of annually disturbed soil within the existing developed areas of the light station. Additional partial woody and/or herbaceous vegetation clearing and periodic (annual or less frequently) soil disturbance in the historically cleared area adjacent to the light station limited to under two acres.
- **Moderate**—Noticeable changes, that would be either stabilize or destabilize the soil structure, in the amount of annually disturbed soil within the existing developed areas of the light station and/or additional partial or complete woody vegetation clearing (and some herbaceous vegetation clearing) and periodic (annual or less frequently) soil disturbance in the historically cleared area adjacent to the light station ranging in extent from two to four acres.
- **Major**—Highly noticeable changes in the amount of disturbed or exposed soil surfaces both within the light station complex as well as in the entire adjacent historically cleared area where there would be complete removal of woody vegetation and herbaceous vegetation would be periodically (annually or more frequently) mowed.

#### **Duration:**

- **Short-Term**—Changes lasting less than one year before returning to currently existing conditions
- **Long-Term**—Changes lasting longer than one year as a result of changes in approaches to grounds maintenance

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 5.1.1 Alternative I—No-Action Alternative

**Analysis**—The No-Action Alternative would continue the NPS strategy of preserving the existing landscape through stabilization, on-going maintenance, and repair of any existing landscape features. This would entail maintaining the existing gardens and walkways, but would not involve any additional clearing other than a 100-foot defensible fire perimeter around the light station complex. The amount of material cleared and soil exposed to create the fire perimeter would have a negligible impact on geology and soils at the light station. The No-Action Alternative would not disturb soil as a result of new construction, garden expansion, or other activities. Consequently, there would be no change in erosion potential. The existing trails would be maintained, but not expanded or improved. No individual impacts would be anticipated to the geology, soils, or topography of the light station complex as a result of the No-Action Alternative.

**Cumulative Impacts**—The recently completed erosion control work would continue to stabilize and preserve the slope below the light station. Additional work on the lighthouse, such as interior repairs/improvements and utility upgrades would be concentrated in the location of the light station complex only and would generate minimal runoff. It is not likely that any of these cumulative actions would have any impact on geology or topography in the vicinity of the light station complex. With the previously completed erosion control project as the primary factor, cumulative impacts to geology, soil, and topography resources with the No-Action Alternative would be long-term, minor, and beneficial.

**Conclusion**—The No-Action Alternative would have no individual impacts, but a cumulative, long-term, minor, beneficial impact on geology, soils, and topography would ensue from the previously completed erosion control project.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore's general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore's resources or values.

### 5.1.2 Alternative II

**Analysis**—Alternative II would result in the rehabilitation and restoration of the light station yard to the period of interpretation from 1902 to 1947. This rehabilitation and restoration effort would include the ornamental and vegetable gardens as well as restoration of that portion of the historic clearing associated with the arc of the historic lighthouse light. Herbaceous, grassy, and lower-growing woody vegetation in the historic clearing would remain minimizing erosion, and the clearing would be maintained by periodic mowing. Horticultural and other activities within the light station building complex would have short-term and long-term negligible adverse impacts on soil erosion potential. Alternative II, like Alternative I, calls for the creation of a 100-foot defensible fire perimeter around the light station complex. In this case, the defensible fire perimeter would only include those existing forest edge areas not within the arc of the historic lighthouse light. Some marginal increase in soil exposure would result from the partial clearing efforts. However, as with the clearing efforts within the arc of the historic light, grassy and herbaceous vegetative cover remaining in the fire perimeter cleared area would minimize change in erosion potential even though runoff might increase somewhat. Alternative II would result in individual, short-term and long-term, negligible, adverse impacts on soil erosion potential.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

**Cumulative Impacts**—The recently completed erosion control work would continue to stabilize and preserve the slope below the light station. Additional work on the lighthouse, such as interior repairs/improvements and utility upgrades would be concentrated in the location of the light station complex only and would create minimal potential for soil erosion. It is not likely that any of these potential cumulative impacts would have any impact on geology or topography. With the erosion control project as the primary factor, cumulative impacts to geology, soil, and topography resources with Alternative II would be long-term, moderate and beneficial.

**Conclusion**—Implementation of this alternative would result in individual short-term and long-term, negligible, adverse impacts from minimal land disturbance during rehabilitation and restoration work including partial vegetation removal in the historic clearing. Cumulative impacts from Alternative II on soil erosion potential would be long-term, moderate, and beneficial primarily from the previously completed erosion control project.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore's general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore's resources or values.

#### 5.1.3 Alternative III

**Analysis**—Most of the elements of Alternative III are the same as for Alternative II, which would include the restoration of the light station yard to the period of interpretation from 1902 to 1947. One difference between Alternative II and III is that Alternative III calls for restoring the entire historic cleared area and maintaining the clearing through the use of periodic prescribed burns. This alternative would result in clearing four acres including the removal of trees with a 6-inch dbh or greater and brush greater than four feet in height in the entire historic clearing. Some increase in soil exposure would result from the clearing efforts and occasional prescribed burns throughout the historically cleared area. However, there would be only a minor increase in erosion potential. Furthermore, research on periodic burning of grassland/prairie areas has shown soil fertility increases from a combination of increased surface light intensity, better water availability early in the growing season, and increased availability of inorganic nitrogen. Free-living soil microbes, including nitrogen-fixers also benefit from more available phosphorus and warmer soil temperatures (Knapp et al. 1998). The existing trails would be maintained, but not expanded or improved. No changes would be anticipated to the geology or topography of the light station complex with the Alternative III. Individually, Alternative III would result in short-term and long-term, minor, adverse impacts on soil erosion potential in the vicinity of the light station.

**Cumulative Impacts**—The recently completed erosion control work would continue to stabilize and preserve the slope below the light station. Additional work on the lighthouse, such as interior repairs/improvements and utility upgrades would be concentrated in the location of the light station complex only and would generate minimal soil runoff. It is not likely that any of these potential cumulative impacts would have any impact on geology or topography. With the previous erosion control project as the primary factor, cumulative impacts to geology, soil, and topography resources with Alternative III would be long-term, moderate and beneficial.

**Conclusion**—Individually, this alternative would have short-term and long-term, minor, adverse impacts on soil erosion potential in the vicinity of the light station. Cumulatively,

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

Alternative III would have long-term, moderate, beneficial impacts on soil erosion potential and fertility in the vicinity of the light station, again, primarily as a result of the previously completed erosion control work.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore’s general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore’s resources or values.

## 5.2 Visitor Use and Experience

### 5.2.1 Methodology

Impact analysis focused on the potential changes in the Raspberry Island Light Station landscape that would change the ability of the NPS staff to interpret the history of the site to visitors, to meet the visitor experience goals for the Apostle Islands National Lakeshore, and the direction provided by NPS *Management Policies* (NPS 2001).

**Basis of Analysis**—Both the type of landscape change (building, structure, natural landscape elements) and the magnitude of the change in terms of size and visibility were examined based upon the following:

- NPS staff ability to adequately provide information to visitors regarding park resources, interpret natural and cultural resources, and overall visitor satisfaction.
- The visitor to effectively experience and understand the resources key to the park’s enabling legislation.

#### **Intensity, Duration, and Type of Impact:**

- **Negligible**—Any changes in landscape appearance would be so slight that only NPS personnel and repeat visitors to the site would notice, e.g. small changes in the size or configuration of existing garden spaces, decorative additions or deletions to landscape elements (such as painted stones around flower beds), etc.
- **Minor**—Preservation of landscape appearance would assist NPS personnel in helping visitors interpret the history of the site. Adversely, minor impacts could include continued exterior deterioration of some of the contributing structures, placement of new small structures within the cultural landscape, etc. The impact would be slight but detectable, and would affect few visitors.
- **Moderate**—Benefits to visitor experience might include limited clearing of sections or all of the historically cleared area around the light station along with interpretive signage/literature, limited, historically accurate improvements of the exterior treatment of contributing structures and buildings, etc. Adversely, moderate impacts could include substantial continued deterioration of historic structures and buildings exteriors, placement of large and more noticeable new structures within the cultural landscape, continued regrowth of the historically cleared area. The impact is readily apparent, and would affect many visitors.
- **Major**—Changes in landscape appearance that would severely or exceptionally affect the visitor experience of the site and further enhance or detract from the ability of NPS staff to



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

interpret the site history to visitors. Beneficial examples might include total restoration of the historically cleared area with interpretive signage/literature including a short loop trail highlighting the historic use and maintenance of the area, large-scale improvements in rehabilitation of contributing elements (structures and buildings) exterior treatments, etc. Adversely, substantial continued deterioration of historic structures and buildings exteriors, placement of new structures in highly visible portions of the cultural landscape, etc. The impact would affect most visitors.

### **Duration:**

- **Short-Term**—Lasting only one visitor season.
- **Long-Term**—Lasting multiple visitor seasons or essentially permanent changes in the landscape.

### **5.2.2 Alternative I—No-Action Alternative**

**Analysis**—The light station at Raspberry Island would continue to be one of the most visited places in the Apostle Islands National Lakeshore and would be staffed by seasonal NPS staff. However, with the No-Action Alternative, no improvements to the cultural landscape of the light station complex would be completed other than routine preservation and maintenance. Specifically, this alternative would entail that NPS maintain the light station and its associated trails in their current condition. Over time, it is likely that the enjoyment of visitors would decrease with this alternative due to the decreasing ability of the park to adequately provide an appropriate context for interpretation of the light station and its uses at the turn of the century. In addition, this alternative would not allow for any clearing to take place to restore the landscape back to its original dimensions, other than a 100-foot defensible fire perimeter around the building complex. The significance of the larger cultural landscape of the light station, particularly the role of the clearing, would not be readily apparent to visitors. This would further decrease the ability of visitors to experience the extent of the original light station complex. Individually, the No-Action Alternative would result in long-term, moderate adverse impacts to the visitor experience at Raspberry Island.

**Cumulative Impacts**—Cumulative impacts associated with this alternative include the recently completed erosion control project. This project would preserve the bluff area of Raspberry Island and allow visitors to enjoy the area for many more years than if the project, which secured the long-term stability of the light station buildings, had not been undertaken. Rehabilitation and restoration efforts at the light station and associated buildings would improve the ability of NPS to interpret the “working-period” of the light station and would increase the enjoyment of visitors. Accessibility to and within buildings would also be improved. Cumulative impacts would be long-term, minor, and beneficial to the visitor experience.

**Conclusion**—Individually, the No-Action Alternative would result in long-term, moderate adverse impacts to the visitor experience at Raspberry Island. Cumulative impacts from other actions including lighthouse rehabilitation would be long-term, minor, and beneficial to visitor experience in spite of this No-Action Alternative.

### **5.2.3 Alternative II**

**Analysis**—The light station at Raspberry Island would continue to be one of the most visited places in the Apostle Islands National Lakeshore and visitor experiences would likely improve with implementation of Alternative II. The ability of visitors to understand the story of the light station development would be enhanced with rehabilitation and restoration of gardens and

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

small-scale features in the landscape. The changes to the historic cleared area would focus on removing the larger trees west of predetermined compass lines extending northwest and southeast from the lighthouse tower. This would allow visitors, when in the lighthouse itself, a clearer view from the light station to the water similar to the historic view of the lighthouse keepers. It would also provide a view of the light station from the lake more similar to the historic view. Although visitor experience is likely to be disrupted in the short-term during the implementation phase, this combination of improvements is likely to increase visitor enjoyment and give NPS staff additional interpretative resources by presenting a visually continuous landscape that invokes the light station's interior and exterior historic past. Individually, this alternative would result in long-term, moderate, beneficial impacts to visitor experience.

**Cumulative Impacts**—The erosion control project would preserve the bluff area of Raspberry Island Light Station and allow visitors to enjoy the area for many more years than if the project, which secured the long-term stability of the light station buildings, had not been undertaken. In addition, various exterior and interior treatments proposed for the lighthouse and associated buildings would provide a greater understanding of the story of historic living conditions and operations of the light station. Accessibility to and within buildings would also be improved. Utility upgrades have been sited to minimize potential visibility to visitors and impacts to the cultural landscape. The proposed treatments would improve the ability of NPS to interpret the “working-period” of the light station and will likely increase the enjoyment of visitors. Cumulative impacts would be long-term, moderate, and beneficial to the visitor experience.

**Conclusion**—Alternative II would have an individual, short-term, negligible adverse impact on visitor experience due to disruptions during implementation, however the long-term impacts would be moderate and beneficial. The cumulative impacts associated with the erosion control project and exterior and interior rehabilitation of the lighthouse and associated buildings would add to the beneficial impacts of Alternative II, providing an overall long-term, moderate, beneficial impact on visitor experience.

### 5.2.4 Alternative III

**Analysis**—Alternative III would incorporate all of the proposed improvements to the light station yard described in Alternative II and would also include restoring the entire extent and visual character of the historic cleared area associated with the light station complex. The cleared area would be maintained using periodic prescribed burns. Although these activities could initially disrupt the visitor experience in the short-term; the long-term impacts would provide visitors with a more accurate understanding of the historic period and functioning of the light station. The cleared area would give visitors a view from the entire light station to the water similar to the one seen by light keepers. The view of the light station from the lake would also be very similar to that of the historic period. In addition, the cleared and restored lawns and clearing would give NPS staff greater resources to interpret the light station by presenting a visually continuous landscape that invokes the light station's historic past. This alternative would result in long-term, moderate, beneficial impacts to the visitor experience at the Raspberry Island Light Station.

**Cumulative Impacts**—The recently completed erosion control project would preserve the bluff area of Raspberry Island Light Station and allow visitors to enjoy the area for many more years than if the project, which insured the long-term stability of light station structures, had not been undertaken. In addition, the various rehabilitation efforts planned for the lighthouse and associated buildings would enhance visitor experience. Accessibility to and within buildings would also be improved. Utility upgrades have been sited to minimize visibility to visitors and potential impacts to the cultural landscape. These improvements would enhance the ability of

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

NPS to interpret the “working-period” of the light station and would likely increase the enjoyment of visitors. Cumulative impacts would be long-term, moderate, and beneficial to the visitor experience.

**Conclusion**—Alternative III would have an individual short-term, minor, adverse impact on visitor experience while the landscape improvements were being implemented. Once the initial work was completed, this alternative would result in long-term, moderate, beneficial impacts to the visitor experience at the Raspberry Island Light Station. Cumulative impacts would also be long-term, moderate, and beneficial to visitor experience.

### 5.3 Park Operations

#### 5.3.1 Methodology

Impact analysis emphasizes changes in management of the light station and in the level of site maintenance required.

**Basis of Analysis**—This analysis focused on the ability of the park to adapt or increase/decrease operations, maintenance, and staff levels in response to implementing and maintaining any changes at the Raspberry Island Light Station.

#### **Intensity, Duration, and Type of Impact:**

- **Negligible**—Changes in the duties or level of maintenance required would be so slight, in terms of staffing levels or dedicated time, that the impact would be barely perceptible.
- **Minor**—Beneficially, changes in park operations would slightly lessen staff duties, leaving more time for interpretive responsibilities. Adversely, park operational duties would slightly increase without a subsequent increase in staffing. The impact would be slight, but detectable.
- **Moderate**—A beneficial impact would include a decrease in the current levels of required maintenance, placing less demand on operating budgets and staff. Adversely, park operational duties would increase without a subsequent increase in staffing. The impact would be readily apparent.
- **Major**—Site maintenance requirements would significantly decrease over current levels placing less demand on operating budgets and staffing. Adversely, park operational duties would substantially increase without a subsequent increase in staffing or implementation funding. The impact would be severely adverse or exceptionally beneficial.

#### **Duration:**

- **Short-Term**—Lasting less than one year.
- **Long-Term**—Lasting more than one year or essentially permanent changes.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 5.3.2 Alternative I—No-Action Alternative

**Analysis**—The No-Action Alternative would maintain the existing staffing levels and general maintenance responsibilities associated with the Raspberry Island Light Station. This would include having one to two park interpreters living on the island during the June to September season. The park staff would continue to be responsible for any interpretive duties as well as for routine day-to-day maintenance of the existing structures, docks, and grounds. The grounds-keeping duties would continue to require one day's maintenance work per week. The local volunteer group would also continue to come to the island to assist in maintenance of the gardens. Under this alternative it is assumed that the costs would remain relatively the same as current operating costs with minor increases due to additional defensive fire perimeter clearing responsibilities. Individually, this alternative would result in long-term, negligible, adverse impacts to park operations.

**Cumulative Impacts**—Cumulative impacts that would affect park operations would include the rehabilitation of the exterior and interiors of the lighthouse and associated buildings and structures, and the upgrading of on-site utilities. These actions would add more park staff custodial and maintenance duties. In addition to the daily custodial responsibilities at the light station, there would be increased winterizing responsibilities for the lighthouse and other structures as well as for utility system components. It is estimated that these improvements would increase the custodial/maintenance workload of current staffing levels resulting in a long-term, minor, adverse impact. The utility system upgrades would improve quality of life for seasonal park staff assigned to Raspberry Island thus resulting on a long-term, moderate, beneficial impact in this regard.

**Conclusion**—Individually, this alternative would result in long-term, negligible, adverse impacts to park operations. Cumulatively, this alternative would have a long-term, minor, adverse impact on the custodial/maintenance workload of park employees. However, there would be a cumulative, long-term, moderate, beneficial impact on the quality of life of seasonal on-island employees from living quarters improvements and utility improvements.

### 5.3.3 Alternative II

**Analysis**—This alternative calls for rehabilitating and restoring the light station landscape to the period of interpretation. Pedestrian circulation in the light station yard and portions of the historic clearing would be restored or preserved. Small-scale features within the landscape, such as the range markers and post and wire fence, would be preserved, restored or reconstructed. The ornamental and vegetable gardens would be restored and the cinder walkways would be rehabilitated. The surviving portions of the wood walkways would be preserved and used to interpret the earlier character of circulation at the light station. These wood walkways would require that new maintenance procedures be implemented to better protect and preserve the plank walks. Trees and brush west of compass lines corresponding to the arc of the historic light would be removed to re-establish a view of the lake from the lighthouse similar to that of the historic period. The 100-foot defensive fire perimeter would also be maintained around the portions of the light station building cluster not already cleared as part of the historic light arc. The Apostle Islands National Lakeshore staff would also continue to be responsible for any interpretive duties as well as for routine day-to-day maintenance of the existing structures, docks, and grounds. These duties would require additional staff time to accomplish, and unless additional funding was available to increase summer seasonal staff, could require adjustment of full-time staff responsibilities. As in Alternative I, assistance in the maintenance of the gardens would be provided by volunteer organizations. Alternative II would have an individual, short-term and long-term, minor, adverse impact on park operations and maintenance.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

**Cumulative Impacts**— Cumulative impacts that would affect park operations would include the rehabilitation of the exterior and interiors of the lighthouse and associated buildings and structures, and the upgrading of on-site utilities. These actions would add more park staff custodial and maintenance duties. In addition to the daily custodial responsibilities at the light station, there would be increased winterizing responsibilities for the lighthouse and other structures as well as for utility system components. It is estimated that these improvements would increase the custodial/maintenance workload of current staffing levels resulting in a long-term, minor, adverse impact. The utility system upgrades would improve quality of life for seasonal park staff assigned to Raspberry Island thus resulting on a long-term, moderate, beneficial impact in this regard.

**Conclusion**—This alternative would have both individual and cumulative, long-term, minor, adverse impacts on park operations by placing additional duties on existing full-time custodial/maintenance staff and on seasonal, on-island staff. However, there would be a cumulative, long-term, moderate, beneficial impact on seasonal staff quality of life as a result of improved living quarters and utility systems.

#### 5.3.4 Alternative III

**Analysis**— As with Alternative II, Alternative III calls for rehabilitating and restoring the light station landscape to the period of interpretation. Pedestrian circulation in the light station yard and portions of the historic clearing would be restored or preserved. Small-scale features within the landscape, such as the range markers and post and wire fence, would be preserved, restored or reconstructed. The ornamental and vegetable gardens would be restored and the cinder walkways would be rehabilitated. The surviving portions of the wood walkways would be preserved and used to interpret the earlier character of circulation at the light station. These wood walkways would require that new maintenance procedures be implemented to better protect and preserve the plank walks. Unlike the approach with Alternative II, Alternative III would involve restoring the entire historic clearing of approximately four acres by removing essentially all trees and brush in the forest edge area back to the border of mature forest (wilderness-managed area). Occasional low-intensity prescribed burns would be conducted following the initial removal of brush and trees in order to maintain the historic clearing. The extent of historic clearing restoration would include an area beyond 100 feet from the light station building cluster. Therefore, there would be no separate 100-foot defensible fire perimeter with this alternative. Park staff would maintain both the clearing and the restored landscape elements. Keeping this area maintained would add additional grounds maintenance responsibilities for full-time and seasonal maintenance staff. In addition, park staff would also continue to be responsible for any interpretive duties as well as for day-to-day maintenance the existing light station structures, docks, and grounds. This alternative would result in an individual long-term, moderate, adverse impact to park operations.

**Cumulative Impacts**— Cumulative impacts that would affect park operations would include the rehabilitation of the exteriors and interiors of the lighthouse and associated buildings and structures, and the upgrading of on-site utilities. These actions would add more park staff custodial and maintenance duties. In addition to the daily custodial responsibilities at the light station, there would be increased winterizing responsibilities for the lighthouse and other structures as well as for utility system components. It is estimated that these improvements would increase the custodial/maintenance workload of current staffing levels resulting in a long-term, moderate, adverse impact. The utility system upgrades would improve quality of life for

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

seasonal park staff assigned to Raspberry Island thus resulting on a long-term, moderate, beneficial impact in this regard.

**Conclusion**—Alternative III would have an individual and cumulative long-term, moderate, adverse impact on park custodial and maintenance operations. However, there would be a cumulative, long-term, moderate, beneficial impact on seasonal staff quality of life as a result of improved living quarters and utility systems.

### 5.4 Ecological Resources

#### 5.4.1 Methodology

Impact analysis focused on the disturbance of the existing early successional forest edge area (ecotone) in the historically cleared area affected by each alternative. Impacts to wildlife are also considered.

**Basis of Analysis**—The acreage of disturbed forest edge and well as the type of disturbance is also examined, e.g. species and size of trees and shrubs removed, means of vegetation clearing and control, impacts to wildlife, etc.

#### **Intensity, Duration, and Type of Impact:**

- **Negligible**—Beneficially, natural succession within the forest edge area surrounding the light station would be left undisturbed with the only management being small-scale control of invasive plant species. Adversely, minimal brush clearing or removal of hazard trees would be the only disturbances to ecological succession in this area.
- **Minor**—Adversely, disturbance of the forest edge area surrounding the light station is between one half and two acres in size and is limited to the clearing of trees over 6-inch dbh. Beneficially, natural succession within the forest edge area surrounding the light station would be left undisturbed with management of invasive species and use of periodic mowing or low-intensity ground fires to reduce fuel loads and improve soil nutrient levels.
- **Moderate**—Adversely, disturbance of the forest edge area surrounding the light station would be between two and four acres in size, and could include clearing of both variously sized trees and brush. Beneficially, natural succession within the forest edge area surrounding the light station would be left undisturbed with management of invasive species and use of periodic low-intensity ground fires to reduce fuel loads and improve soil nutrient levels.
- **Major**—Adversely, disturbance of the forest edge area surrounding the light station would be greater than four to six acres in size, and could include clearing of all woody vegetation. Beneficially, natural succession within the remaining undisturbed forest edge area surrounding the light station would be left undisturbed with management of invasive species, planting of some important native species used as food by wildlife, and use of periodic low-intensity ground fires to reduce fuel loads and improve soil nutrient levels.

#### **Duration:**

- **Short-Term**—Changes evident for less than a year after implementation of any management prescription
- **Long-Term**—Changes evident for a longer than a year after implementation of any management prescription.



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 5.4.2 Alternative I—No-Action Alternative

**Analysis**—The No-Action Alternative would continue to preserve the light station complex, including the surrounding landscape. At the current level of maintenance this would allow the cleared area to continue its slow process of natural succession. The minimal amount of clearing required to maintain the 100-foot defensible fire perimeter would have a negligible impact on ecological resources at the park. This alternative would result in an individual, short-term and long-term, negligible, beneficial impact to the ecological resources in the vicinity of the light station through preservation of forest edge habitat.

**Cumulative Impacts**—The planned interior and exterior renovations of the light station complex would have no impact on the ecological resources on the island. The planned utility improvements may have a short-term, negligible adverse impact on ecological resources during their placement, but would have no long-term impact. The recently completed erosion control efforts, in conjunction with the No-Action Alternative, would have a long-term, negligible adverse impact on ecological resources on the island since the erosion control effort removed some of the existing clayscape plant community and changed the local composition of the natural plant community. Cumulative impacts would be long-term, negligible, and adverse.

**Conclusion**—Individually the No-Action Alternative would have a long-term, negligible, beneficial impact on ecological resources on Raspberry Island by allowing the stages of natural succession in the forest edge area to continue. Cumulatively, and mainly as a result of the completed erosion control efforts along the bluff in front of the light station, this alternative would have a long-term, negligible, adverse impact on ecological resources.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore's general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore's resources or values.

### 5.4.3 Alternative II

**Analysis**—The rehabilitation, restoration and reconstruction of small-scale features in the light station yard would have a negligible impact on ecological resources within the light station area. Trees and brush in a substantial portion of the historic clearing would be removed to re-establish much of the historic view from the light house. Trees and brush from portions of the 100-foot defensive fire perimeter not included in the historic clearing work would also be removed. Overall, this alternative would have long-term, minor, adverse impacts on ecological resources associated with the forest edge habitat surrounding the light station.

**Cumulative Impacts**—The planned interior and exterior renovations of the light station complex would have no impact on the ecological resources on the island. The planned utility improvements may have a short-term, negligible adverse impact on ecological resources during their placement, but would have no long-term impact. The recently completed erosion control efforts, in conjunction with the Alternative II, would have a long-term, negligible adverse impact on ecological resources on the island since the erosion control effort removed some of the existing clayscape plant community and changed the local composition of the natural plant community. Cumulative impacts would be long-term, negligible, and adverse.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

**Conclusion**— Individually, Alternative II would have a long-term, minor, adverse impact on ecological resources on Raspberry Island. Cumulatively, this alternative would have a long-term, negligible, adverse impact on ecological resources on Raspberry Island.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore’s general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore’s resources or values.

#### 5.4.4 Alternative III

**Analysis**— The rehabilitation, restoration and reconstruction of small-scale features in the light station yard would have a negligible impact on ecological resources within the light station area. Trees and brush from all of the historic clearing would be removed to re-establish the entire clearing and the historic view from the light house and of the lighthouse from the lake. The 100-foot defensive fire perimeter area would be included in this more intensive historic clearing work. Occasional-low intensity prescribed burns on a four or five year cycle would be used to maintain the 4-acre historic clearing. This alternative would establish a fire-tolerant plant community that is compatible with the historic open meadow character of the clearing. Complete removal of trees and brush in the historic clearing would result in long-term, moderate, adverse impacts to existing ecological resources associated with the forest edge community.

**Cumulative Impacts**— The planned interior and exterior renovations of the light station complex would have no impact on the ecological resources on the island. The planned utility improvements may have a short-term, negligible adverse impact on ecological resources during their placement, but would have no long-term impact. The recently completed erosion control efforts had a long-term, negligible adverse impact on ecological resources on the island since the erosion control effort removed some of the existing clayscape plant community and changed the local composition of the natural plant community. Cumulative impacts associated with both the previous erosion control efforts and Alternative III implementation would be long-term, moderate, and adverse.

**Conclusion**—Individually and cumulatively, Alternative III would have a long-term, moderate adverse impact on ecological resources on Raspberry Island.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore’s general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore’s resources or values.

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 5.5 Cultural Resources

#### 5.5.1 Methodology

Impact analysis was based primarily on the result of changes that would either bring the cultural landscape into closer agreement with the identified period of interpretation (1902 to 1947) or to allow the landscape to further deviate from this period of interpretation.

**Basis of Analysis**—The basis of analysis was an evaluation of the mixture of preservation, rehabilitation, and restoration as defined in the Secretary of Interior's Standards for the Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes that would best accomplish the goal of recreating the identified period of interpretation at the Raspberry Island Light Station.

#### **Intensity, Duration, and Type of Impact:**

- **Negligible**—Changes in landscape elements would be altered but would be so small so as to not noticeably change the existing cultural landscape.
- **Minor**—Beneficially, rehabilitation and targeted restoration would be confined to the main light station building cluster. Adversely, the status quo would be maintained with on-going minor preservation efforts within the confines of the light station building cluster.
- **Moderate**—Beneficially, rehabilitation and targeted restoration would include the main light station building cluster as well as some minor restoration of the historically cleared area adjacent to the light station buildings. Adversely, current preservation efforts within the main light station would be decreased with no attempt to restore or interpret the historically cleared area, and the cultural landscape would be further impacted by placement of new, but partially obscured, structures in the landscape.
- **Major**—Beneficially, rehabilitation and targeted restoration would include the main light station building cluster as well as major restoration of the historically cleared area and limited reconstruction of small structures within the historically cleared area. Adversely, current preservation efforts within the main light station would be decreased, and the cultural landscape would be further impacted by placement of new and highly visible structures. There would be no attempt to restore or interpret the historically cleared area.

#### **Duration:**

- **Short-Term**—Changes to the cultural landscape would last one year or less.
- **Long-Term**—Changes to the cultural landscape would be semi-permanent to permanent.

#### 5.5.2 Alternative I—No-Action Alternative

**Analysis**—This treatment alternative emphasizes preservation of existing forms through stabilization, on-going preservation maintenance, and repair of historic materials and features. This alternative maintains the historic period land use pattern, physical relationships, features, and overall character of the yard and includes the proposed plan to update the living quarters and utilities on the island. The resources in the light station yard and clearing would be maintained at a low level of preservation and are not all historically accurate. There is no protection or stabilization of identified archeological features. This alternative does not allow for the accurate, in depth interpretation of the larger landscape as a whole as the clearing is not spatially or visually accurate to the period of interpretation. Taking no-action would result in individual, long-term, moderate adverse impacts to the cultural landscape of Raspberry Island Light Station.

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

**Cumulative Impacts**—The future foreseeable actions of restoration and rehabilitation of the lighthouse and associated buildings and the upgrade of utilities would have a long-term, moderate beneficial impact on the cultural landscape. The utility structures would either be located underground or would be well screened. The recently completed erosion control project has a minor adverse impact on the cultural landscape but it was a feature constructed out of necessity to protect the historic light station. Cumulative impacts would be long-term, minor, and beneficial.

**Conclusion**—Taking no-action would result in individual, long-term, moderate adverse impacts to the cultural landscape at Raspberry Island. This would be due to allowing the forest to continue to succeed in the historically cleared areas and continuation of minimal preservation efforts. Cumulative impacts would be long-term, minor, and beneficial.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore's general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore's resources or values.

#### 5.5.3 Alternative II

**Analysis**—This treatment alternative restores the feeling and association of the period of interpretation to the light station yard by incorporating all provisions for the preservation, rehabilitation, and restoration of historic landscape features. This alternative calls for the removal of non-historic plantings and landscape elements, such as the grape arbor and vine. Additionally, Alternative II includes restoration and documentation of small-scale features in the portions of the clearing, e.g. the range markers. Alternative II calls for tree and brush clearing in an area within the historic navigational arc of the light station. This would involve the removal of trees greater than six inches dbh and brush more than 4 feet in height. Visual continuity from the lighthouse to the lake and from the lake to the light station would be restored to the period of interpretation making clearer interpretation and understanding possible. However, the entire historic clearing, particularly east of the light station buildings would not be cleared as part of this alternative. Alternative II would result in individual, long-term, moderate beneficial impacts to light station cultural resources.

**Cumulative Impacts**—The future foreseeable actions of restoration and rehabilitation of the lighthouse and associated buildings and the upgrade of utilities would have a long-term, moderate beneficial impact on the cultural landscape. The utility structures would either be located underground or would be well screened. The recently completed erosion control project has a minor adverse impact on the cultural landscape but it was a feature constructed out of necessity to protect the historic light station. Overall, the cumulative impacts of other actions along with implementation of Alternative II would be long-term, moderate and beneficial.

**Conclusion**—Alternative II would result in individual and cumulative, long-term, moderate beneficial impacts to light station cultural resources.

**Impairment**—Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore's general management plan

## CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

### RASPBERRY ISLAND LIGHT STATION

---

or other relevant National Park Service planning documents, there would be no impairment of the lakeshore's resources or values.

#### 5.5.4 Alternative III

**Analysis—** As with Alternative II, this treatment alternative restores the feeling and association of the period of interpretation to the light station yard by incorporating all provisions for the preservation, rehabilitation, and restoration of historic landscape features. This alternative calls for the removal of non-historic plantings and landscape elements, such as the grape arbor and vine. Additionally, Alternative III includes restoration and documentation of small-scale features in the portions of the clearing, e.g. the range markers. Alternative III calls for complete tree and brush removal within the entire historic clearing. Visual continuity from the lighthouse to the lake and from the lake to the light station would be restored to the period of interpretation making clearer interpretation and understanding possible. Alternative III would result in individual, long-term, moderate beneficial impacts to light station cultural resources.

**Cumulative Impacts—** The future foreseeable actions of restoration and rehabilitation of the lighthouse and associated buildings and the upgrade of utilities would have a long-term, moderate beneficial impact on the cultural landscape. The utility structures would either be located underground or would be well screened. The recently completed erosion control project has a minor adverse impact on the cultural landscape but it was a feature constructed out of necessity to protect the historic light station. Overall, the cumulative impacts of other actions along with implementation of Alternative III would be long-term, moderate and beneficial.

**Conclusion—** Alternative III would result in individual and cumulative, long-term, moderate beneficial impacts to light station cultural resources.

**Impairment—** Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Apostle Islands National Lakeshore; (2) key to the natural or cultural integrity of the lakeshore; or (3) identified as a goal in the lakeshore's general management plan or other relevant National Park Service planning documents, there would be no impairment of the lakeshore's resources or values.

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 6.0 CONSULTATION AND COORDINATION

#### 6.1 Consultation

As mentioned in Section 1.0 of this EA, the NPS agreed to developing the Raspberry Island Light Station CLR as a stipulation of a March 30, 2001, Memorandum of Agreement with the State Historical Society of Wisconsin allowing implementation of erosion control measures on the bluff in front of the light station. On-going consultation on various activities at the Raspberry Island Light Station have ensued since 2001. Most recently, the NPS received notification of a finding of *no adverse effect* from the SHPO regarding the proposed utility improvements discussed in Section 5.0 of this EA. This notification was dated April 1, 2004.

Additional SHPO consultation is on-going regarding the CLR.

#### 6.2 Coordination

Coordination with U.S. Fish and Wildlife and Wisconsin Department of Natural Resources will be completed prior to signing of a decision document.

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

# **CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT RASPBERRY ISLAND LIGHT STATION**

---

## **7.0 LIST OF PREPARERS**

### **7.1 Project Team**

- Jerry Lang, Ph.D.—Program Manager, Woolpert LLP
- Will Ballard, AICP—Environmental Planner, Woolpert LLP
- Dave Dister—Natural Resource Specialist, Woolpert LLP
- Martha Alarie—Environmental Planner, Woolpert LLP
- Patrick O'Bannon—Cultural Resource Specialist, HRA Gray & Pape
- Ann Emmons—Cultural Resource Specialist, HRA Gray & Pape
- Barbara Smith-Steiner—Cultural Resource Specialist, HRA Gray & Pape
- Janene Caywood—Cultural Resource Specialist, HRA Gray & Pape

### **7.2 NPS Consultants**

- Nancy Baker—NPS Project Manager, Denver Service Center
- Bob Mackreth—Historian, Apostle Islands National Lakeshore

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

---

### 8.0 REFERENCES

- ARCADIS. April 17, 2003. "Utility Concepts and Estimates of Restoration." Raspberry Island Boathouse. APIW, 2003
- ARCADIS. January 16, 2004. "Utilities Schematic Design. Raspberry Island Lighthouse Restoration. Apostle Islands National Lakeshore."
- Birnbaum, Charles A., and Christine C. Peters. 1996. "Guidelines for the Treatment of Historic Landscapes," The Secretary of the Interior's Standards for the Treatment of Historic Properties, Heritage Preservation Services, Historic Landscape Initiative, National Park Service.
- Cary S. J. P. F. McDowell and L. J. Graumlich. 1979. "Soils and Surficial Geology of our Four Apostle Islands. (Wisconsin Academy of Sciences. Arts and Letters 67: 14-30.
- Dobie, R. W. 1977. "The Vegetation Ecology of Raspberry, Rocky, and York Islands," Apostle Islands National Lakeshore, Wisconsin. MS Thesis, Michigan Technological University.
- Greenblat, Leah Cheryl. 1989. Plan View, Raspberry Island Light Station, Historic American Buildings Survey. MSS on file, Apostle Islands National Lakeshore, flat files.
- Hiltunen, J. K. 1969. "Invertebrate Macrobenthos of Western Lake Superior," Michigan Academician 1 (2-3): 123-133.
- Judziewicz, E. J. 1990. Grass-of-Parnassus (*Parnassia palustris* L): A State "Threatened" Species Occurring on Outer Island, Apostle Islands National Lakshore, Wisconsin.
- Judziewicz, E. J. and R. G. Koch. 1993. "Flora and Vegetation of the Apostle Islands National Lakeshore and Madeline Island, Ashland and Bayfield Counties, Wisconsin. The Michigan Botanist 32(2): 43-193.
- Knapp, A. K; J. M. Briggs; D. C. Hartnett; and S. L. Collins. 1998. Grassland Dynamics: Long-term Ecological Research in Tallgrass Prairie. Oxford University Press.
- Mackreth, R. 1999. Personal communication with Orloff Miller, HRA Gray & Pape.
- Mickelson, D. M. and T. Edil. 1984. Report on Erosion Problems and Recommendations for Stabilizing Slopes at Raspberry and Outer Island Light Stations, Apostle Islands National Lakeshore.
- Milfred, C. J. and J. Valiga. 1983. Shoreline Erosion in the Apostle Islands National Lakeshore: Identify Areas of Active erosion and Develop Methods to Quantify Rates.
- National Park Service, 1989. "Apostle Islands National Lakeshore, Wisconsin, General Management Plan Environmental Assessment Draft."
- NPS. 1977. National Register of Historic Places Nomination: "The Apostle Islands Lighthouses." A thematic listing following the Apostle Islands National Lakeshore Building Survey of 1975.

## **CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT RASPBERRY ISLAND LIGHT STATION**

---

- NPS. 1987. "Apostle Islands, Official National Park Handbook." Division of Publication, Handbook 141, U.S. Department of the Interior, Washington, D.C.
- NPS. 1989. General Management Plan Environmental Assessment, Draft.
- NPS. 1999. Apostle Islands National Lakeshore Visitation.
- Noble, Vergil E. 1993. "The Archeological Investigation of Four Lighthouse Complexes at the Western End of Lake Superior: The 1988 Testing Program within the Apostle Islands National Lakeshore." National Park Service, Midwest Archeological Center.
- Porter, Robert. 1994 (August 1993). "Draft Interim Cultural Landscape Management Plan," edited by David
- Richner, Jeffrey J. 1987. "Archeological Investigations at Apostle Islands National Lakeshore 1979-1980." National Park Service Midwest Archeological Center, Lincoln.
- Rose, W. J. 1988. Water Resources of the Apostle Islands National Lakeshore, Northern Wisconsin.
- Salzer, Robert J. and David F. Overstreet. 1976. Summary Report: Apostle Island Project, Inventory and Evaluation of Cultural Resources within the Apostle Islands National Lakeshore, Wisconsin. National Park Service, Midwest Archeological Center.
- Smith, G. 1998. 1998 Migratory Bird Survey, Apostle Islands National Lakeshore.
- Smith, G. and J. Van Stappen. 1999. 1998 Breeding Bird Survey Report: Apostle Islands National Lakeshore.
- Snyder, David L. 1994. Raspberry Island Lighthouse Historic Structure Report, Historical Data Section. MSS on file, Apostle Islands National Lakeshore.
- Van Stappen, J and S. Kovar. 1987a. Environmental Assessment, Shoreline Stabilization at Raspberry Island Light Station, Apostle Island National Lakeshore.



## **CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT RASPBERRY ISLAND LIGHT STATION**

---

Van Stappen, J. and S. Kovar. 1987b. Environmental Assessment for Shoreline Stabilization at Outer Island Light Station, Apostle Islands National Lakeshore, Wisconsin.

Van Stappen, J. 1991. "Apostle Islands National Lakeshore Bluff Erosion Monitoring, Resource Management Report RMR 91-4.

Van Stappen, J. 1999. Personal communication with J. Lang, Woolpert LLP.

WDT (Wisconsin Department of Tourism), 1999. 1998 Traveler Expenditures up 12.6 Percent. News Release on [www.travelwisconsin.com/agency/htm](http://www.travelwisconsin.com/agency/htm).

Wilhelm Engineering Company, Inc. 1987. "Geotechnical Investigation Stabilization of the Lake Shoreline, Outer, Michigan, and Raspberry Island Lighthouse Sites, Apostle Islands National Lakeshore, Bayfield, Wisconsin.

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT  
RASPBERRY ISLAND LIGHT STATION**

---

**APPENDIX A  
COMMON VASCULAR PLANTS FOUND IN THE  
VICINITY OF THE RASPBERRY ISLAND LIGHT STATION**

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

Appendix A Common Vascular Plants Found in the Vicinity of the Raspberry Island Light Station <sup>1</sup>	
Common Name	Scientific Name
Blanket Flower	<i>Gaillardia pulchella</i>
Common Buttercup	<i>Ranunculus acris</i>
Canada Thistle	<i>Cirsium arvense</i>
Catnip	<i>Nepeta cataria</i>
Common Chickweed	<i>Cerastium vulgatum</i>
Dandelion	<i>Taraxacum officinale</i>
Daylily	<i>Hemerocallis fulva</i>
Fescues	<i>Festuca</i> sp.
Goldenrod	<i>Solidago canadensis</i> and <i>S. altissima</i>
Field Horsetail	<i>Equisetum arvense</i>
Musk-Mallow	<i>Malva moschata</i>
Mouse-Eared Chickweed	<i>Stellaria longifolia</i>
Common Mullein	<i>Verbascum thapsus</i>
Evening-Primrose	<i>Oenothera</i> sp.
Red Raspberry	<i>Rubus idaeus</i>
Staghorn Sumac	<i>Rhus typhina</i>
Tag Alder	<i>Alnus rugosa</i>
Three-Toothed Cinquefoil	<i>Potentilla tridentata</i>
Timothy	<i>Phleum pratense</i>
White Birch	<i>Betula papyrifera</i>
Wild Rose	<i>Rosa</i> sp.
Willow	<i>Salix</i> sp.
Yarrow	<i>Achillea millefolium</i>
Yellow Birch	<i>Betula lutea</i>
Yellow Chamomile	<i>Anthemis tinctoria</i>
Quaking Aspen	<i>Populus tremuloides</i>
Reed Grass	<i>Calamagrostis canadensis</i>
Serviceberry	<i>Amelanchier</i> sp.
Sweet-Scented Bedstraw	<i>Galium triflorum</i>
Tag Alder	<i>Alnus rugosa</i>
White Clover	<i>Trifolium repens</i>
Wild Lily-of-the-Valley	<i>Maianthemum canadense</i>

<sup>1</sup>From Dobie, R. W. 1977 and from Anderson and Milfred (1979) in NPS (1987).

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---



**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

**APPENDIX B**  
**MOST ABUNDANT BIRD SPECIES ON AND AROUND RASPBERRY ISLAND**

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

Appendix B Most Abundant Bird Species on and Around Raspberry Island <sup>1</sup>	
Common Name	Scientific Name
Bank Swallow <sup>2</sup>	<i>Riparia riparia</i>
Barn Swallow <sup>2</sup>	<i>Hirundo rustica</i>
Belted Kingfisher <sup>2</sup>	<i>Ceryle alcyon</i>
Black-Throated Blue Warbler	<i>Dendroica caerulescens</i>
Chimney Swift	<i>Chaetura pelagica</i>
Cliff Swallow <sup>2</sup>	<i>Hirundo pyrrhonota</i>
Common Loon	<i>Gavia immer</i>
Common Merganser	<i>Mergus merganser</i>
American Crow <sup>2</sup>	<i>Corvus brachyrhynchos</i>
Herring Gull	<i>Larus argentatus</i>
House Wren <sup>2</sup>	<i>Troglodytes aedon</i>
Killdeer	<i>Charadrius vociferus</i>
Lincoln's Sparrow <sup>2</sup>	<i>Melospiza lincolnii</i>
Mallard	<i>Anas platyrhynchos</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Northern Parula	<i>Parula americana</i>
Purple Martin <sup>2</sup>	<i>Progne subis</i>
Red-Breasted Merganser	<i>Mergus serrator</i>
Red-Breasted Nuthatch	<i>Sitta canadensis</i>
Song Sparrow <sup>2</sup>	<i>Melospiza melodia</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Vesper Sparrow <sup>2</sup>	<i>Pooectes gramineus</i>
White-Throated Sparrow	<i>Zonotrichia albicollis</i>
Winter Wren	<i>Troglodytes troglodytes</i>
<sup>1</sup> From Van Stappen and Kovar, 1987a.	
<sup>2</sup> Breeds on the island.	

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT  
RASPBERRY ISLAND LIGHT STATION**

---

**APPENDIX C  
FISH OF THE APOSTLE ISLANDS NATIONAL LAKESHORE REGION**

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---



# CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT

## RASPBERRY ISLAND LIGHT STATION

Appendix C	
Fish of the Apostle Islands National Lakeshore Region	
Common Name	Scientific Name
Alewife	<i>Alosa pseudoharengus</i>
Black Bullhead	<i>Ictalurus melas</i>
Bloater	<i>Coregonus hoyi</i>
Brook Stickleback	<i>Culea inconstans</i>
Brook Trout (includes Coasters)	<i>Salvelinus fontinalis</i>
Brown Trout	<i>Salmo trutta</i>
Burbot	<i>Lota lota</i>
Carp	<i>Cyprinus carpio</i>
Coho Salmon	<i>Oncorhynchus kisutch</i>
Deepwater Sculpin	<i>Myoxocephalus thompsoni</i>
Emerald Shiner	<i>Notropis atherinoides</i>
Eurasian Ruffe	<i>Gymnochephalus cernuus</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Kiyi	<i>Coregonus kiyi</i>
Lake Chub	<i>Couesius plumbeus</i>
Lake Herring	<i>Coregonus artedii</i>
Lake Sturgeon	<i>Acipenser fulvescens</i>
Lake Trout (Lean and Siscowet)	<i>Salvelinus namaycush</i>
Lake Whitefish	<i>Coregonus clupeaformis</i>
Logperch	<i>Percina caprodes</i>
Longnose Dace	<i>Rhinichthys cataractae</i>
Longnose Sucker	<i>Catostomus catostomus</i>
Mottled Sculpin	<i>Cottus bairdi</i>
Ninespine Stickleback	<i>Pungitius pungitius</i>
Northern Pike	<i>Esox lucius</i>
Pygmy Whitefish	<i>Prosopium coulteri</i>
Rainbow Trout	<i>Oncorhynchus mykiss</i>
Rock Bass	<i>Ambloplites rupestris</i>
Round Whitefish	<i>Prosopium cylindraceum</i>
Sea Lamprey	<i>Petromyzon marinus</i>
Shortjaw Cisco	<i>Coregonus zenithicus</i>
Slimy Sculpin	<i>Cottus cognatus</i>
Smallmouth Bass	<i>Micropterus dolomieu</i>
Smelt	<i>Osmerus mordax</i>
Spoonhead Sculpin	<i>Cottus ricei</i>
Spottail Shiner	<i>Notropis hudsonius</i>
Trout Perch	<i>Percopsis omiscomaycus</i>
Walleye	<i>Stizostedion vitreum vitreum</i>
White Sucker	<i>Catostomus commersoni</i>
Yellow Perch	<i>Perca flavescens</i>

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---

**CULTURAL LANDSCAPE REPORT AND ENVIRONMENTAL ASSESSMENT**  
**RASPBERRY ISLAND LIGHT STATION**

---