

# Isle au Haute Boundary Lines

## Summer Camp 2002

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*June 6, 2002*  
**Isle au Haute Boundary Lines**

Isle au Haute is an island located off the coast of Maine approximately seven miles Southeast from the mouth of the Penobscot River. This island has land that is held under both Acadia National Park and private ownership. A major part of this island was donated to Acadia National Park and the National Park Service in 1943.

One of the goals on our trip to Isle au Haute was to accurately locate boundary lines on the ground and compare them to mapped boundary lines. A Trimble Geoexplorer 3 GPS receiver, compass and maps were used to complete the given task. The maps were provided by the (NPS). These maps provided us with the approximate location of the existing boundaries on the ground. We uncovered evidence of old existing boundary monuments to start from and followed specific azimuths to locate additional monuments.

**Task I: Locate and GPS the Eastern Head boundary line.**

**Date: Monday June 3, 2002.**

The Eastern Head boundary line may be found on the southeast end of the island (see attached map) and is defined by two monuments approximately 1220 feet apart. The two monuments are found on either side of the Eastern Head peninsula just above the high tide mark. These monuments are typical Department of Interior brass disks set in bedrock. The boundary line itself passes a large patch of blowdown.

## **Task II: Locate, flag and GPS the Long Pond boundary line.**

**Date: Tuesday June 4, 2002.**

The Long Pond boundary line was located along the western side of Long Pond (see attached map) and has not been surveyed for many years. Due to the lack of maintenance walking the boundary line required a great deal of bushwhacking in order to clear a line of site to GPS the 1.3-mile boundary line. Two iron pins, two cedar posts painted blue and a pile of rocks were found as boundary turning points. Precise compass work was necessary when making foresights and back sights, due to rough terrain and inadequate blazing of the boundary.

## **Conclusion:**

The boundary line that was mapped using GPS technology did not agree with the previously mapped property line data. This may be due to the techniques used to survey the map, the line on the ground, or errors made in preparing the map. The boundary lines had not been maintained and the surveyor may have had difficulty finding old markers causing further error. The property boundary lines should be maintained on a regular basis for ease of identification. Corner posts should be made of a durable, long lasting material such as an iron pipe rather than cedar post. The property line should also be blazed on trees with boundary line paint.

# **Isle Au Haut Deer and Hare Exclosures**

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**Introduction:**

As part of our three-week forestry summer camp with the University of Maine, we spent three days on Isle au Haut collecting data. Isle au Haut is located roughly six miles south of Stonington and thirty miles southwest of Southwest Harbor on Mount Desert Island (MDI). The island is approximately six miles long and three miles wide. A small fishing community is located on the north end along a thoroughfare between Isle au Haut and Kimball Island. There are also residences along the eastern side of the island. Over half of Isle au Haut is part of Acadia National Park. Within that half of the island are located two deer and hare exclosures. The exclosures were erected between 1949 and 1968 as part of a study to monitor the deer and hare browsing impact on Mount Desert Island and Isle au Haut after the 1947 fire on MDI.

**Purpose:**

Our task was to relocate both of the exclosures on Isle au Haut; one at Eli Creek and the other near Long Pond on the east side of the island. Once the exclosures were relocated the next step was to inventory the vegetation inside the exclosures as well as within control plots adjacent to the exclosures. Once the data was collected we compared it to data taken over the last thirty years.

**Methods:**

The Eli Creek exclosure measured 12 meters by 12 meters. It was then divided into two halves, each 12 meters by 6 meters. The exclosure was divided along the east west axis, the southern half excluding both deer and hare. The northern half excluded only deer from the area. The deer and hare exclosure was constructed of both half-inch wire mesh to impede hare entry, as well as a heavier gauge wire mesh to stop deer from

entering. The northern half of the enclosure consisted of only the larger gauge wire mesh, which allowed hare to enter that portion of the enclosure.

At the Eli Creek site, we performed a 100 percent inventory. We counted every tree inside the enclosure regardless of its distance to the fence. The total area inventoried was 144 square meters. The categories we used to inventory the enclosures were: trees with woody stems greater than 2 meters in height; shrubs are woody stems 0.5 to 2 meters in height; saplings are woody stems less than 0.5 meters in height. A shrub count was also collected at the Eli Creek site.

First, it should be noted that the Long Pond enclosure is located about 300 meters north of where is shows on the map provided by Acadia National Park. The Long Pond enclosure was constructed in a totally different fashion. Although the dimensions of the enclosure were the same as Eli Creek, 12 meters by 12 meters, the interior was set up in a different manner. The hare and deer enclosure was in the northeast corner of the entire enclosure. It was erected using the small wire mesh backed with the heavier and larger gauge wire fence. In the deer only portion of the enclosure, 1 meter from the main fence on the west and south sides because we did not measure vegetation within that buffer deer can reach into the enclosure and browse. Hare can access the deer enclosure through the north and east sides.

We performed a 100 percent inventory of the Long Pond enclosure. We counted every tree inside the enclosure. We did not count trees in the 1-meter buffer zone because deer are able to reach through the larger wire mesh and browse. So the actual area inventoried was 116 square meters. The categories we used to inventory the enclosures were: trees with woody stems greater than 2 meters in height; shrubs are

woody stems 0.5 to 2 meters in height; saplings are woody stems less than 0.5 meters in height. A shrub count was also performed at the Long Pond site.

At the Eli Creek exclosure we measured tree height using a Suunto clinometer. To measure tree diameter at breast height (4.5 feet) we used an English measure caliper, then we converted the measure into metric. At the Long Pond exclosure we used a Suunto clinometer to measure tree heights and a metric measure caliper to measure diameter at breast height.

### **Results and Discussion:**

The differences between the 1991 data by (Saeki 1991) and our new data from 2002 is staggering at the Eli Creek exclosure. Saplings in our data include any small tree less than .5 meters. The data from 1991 included any sapling or small tree that could possibly be eliminated in a single browsing. The decrease in shrubby vegetation may be attributed to an increase in herbivores on the island. The sapling numbers in 1991 at the Eli Creek site are very high. We suspect that many of those saplings are now trees, therefore, due to light constraints, there is less habitat suitable for seedling germination. This could be because of the changing water tables in the bog. Table 1 clearly depicts the conditions in the past and how the exclosures are doing now.

At the Long Pond site shrubs and saplings are declining in numbers while the aquatic shrubs at the Eli Creek exclosure are increasing because of the bog like conditions. The Eli Creek exclosure may now no longer be representative of deer habitat on Isle au Haut because of rising water levels. Most of the cedar in what was once a cedar swamp are now dead or dying.

From 1990 to 2002 the Long Pond data shows that the area in the exclosure that excluded hares had an increase in the count of birches, while the area that allowed hares had a decrease in the amount of birch present. The Eli Creek data showed no so such comparison in the amounts of birch present. See the Appendix for supporting documentation on tree counts.

### **Exclosure sapling and shrub comparison by plot**

Table 1

| Long Pond<br>Exclosure |               |             | Long Pond<br>Exclosure |               |             |
|------------------------|---------------|-------------|------------------------|---------------|-------------|
| 2002                   |               |             | 1991                   |               |             |
|                        | # of Saplings | # of Shrubs |                        | # of Saplings | # of Shrubs |
| Deer                   | 0             | 3           | Deer+Hare              | 14            | 15          |
| Hare                   | 6             | 7           | Control                | 2             | 0           |
| Control                | 0             | 1           |                        |               |             |

| Eli Creek Exclosure |               |             | Eli Creek Exclosure |               |             |
|---------------------|---------------|-------------|---------------------|---------------|-------------|
| 2002                |               |             | 1991                |               |             |
|                     | # of Saplings | # of Shrubs |                     | # of Saplings | # of Shrubs |
| Deer                | 13            | 30          | Deer+Hare           | 270           | 1           |
| Hare                | 16            | 21          | Control             | 1632          | 0           |
| Control             | 88            | 147         |                     |               |             |

Table 2

| <b>Long Pond</b>           |             |             |
|----------------------------|-------------|-------------|
|                            | <b>1973</b> | <b>2002</b> |
| Birch in Deer Exclosure    | 10          | 2           |
| Birch in Hare Exclosure    | 10          | 12          |
| PER HECTARE DEER EXCLOSURE | 1235        | 247         |
| PER HECTARE HARE EXCLOSURE | 1852        | 2222        |

Table 3

| TOTAL TREE ENCLOSURE DATA |           |              |           |              |           |              |
|---------------------------|-----------|--------------|-----------|--------------|-----------|--------------|
| LONG POND                 | 1973      |              | 1990      |              | 2002      |              |
|                           | ENCLOSURE | STEMS PER HA | ENCLOSURE | STEMS PER HA | ENCLOSURE | STEMS PER HA |
| BIRCH                     | 20        | 2087         | 110       | 11479        | 14        | 2469         |
| SPRUCE                    | ?         | ?            | 26        | 2713         | 13        | 1794         |
| <b>ELI CREEK</b>          |           |              |           |              |           |              |
| BIRCH                     | 20        | 1389         | 0         | 0            | 0         | 0            |
| SPRUCE                    | ?         | ?            | 12        | 833          | 15        | 1042         |

In the Saeki and Harrison study they differentiated seedlings into their own category aside from the saplings, but in our data interpretation process we added both the seedling and sapling groups together to match our data collection process. This allowed us to compare the sapling categories in the 1990 study to the data we collected in 2002.

### **Conclusion:**

Vegetation has changed on the island due to browsing. The enclosures help to understand the effects of deer and hare browsing on Isle au Haut. To further this study more extensive research is needed on the role that hare and deer interactions play in the island's ecosystem. There is a clear impact on the island from deer and hare browsing, but to what extent is difficult to discern because of the minimal plots investigated. We found two thesis and one report that discussed the overall vegetation and browsing on Isle au Haut but only Saeki and Harrison report presents data on the enclosures.

## APPENDIX:

ELI CREEK DEER EXCLOSURE

| Diameter<br>(cm) | red<br>spruce | cedar  | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|--------|-----------------|---------------------|
| 2.0              | ----          | ----   | 330.58          | 330.58              |
| 4.0              | ----          | ----   | 165.29          | 165.29              |
| 6.0              | 165.29        | ----   | ----            | 165.29              |
| 8.0              | ----          | ----   | ----            | ----                |
| 10.0             | ----          | ----   | ----            | ----                |
| 12.0             | 165.29        | ----   | ----            | 165.29              |
| 14.0             | ----          | ----   | ----            | ----                |
| 16.0             | 165.29        | ----   | ----            | 165.29              |
| 18.0             | ----          | ----   | ----            | ----                |
| 20.0             | ----          | ----   | ----            | ----                |
| 22.0             | 330.58        | ----   | ----            | 330.58              |
| 24.0             | ----          | 165.29 | ----            | 165.29              |
| Species Sum      | 826.45        | 165.29 | 495.87          | 1487.60             |
|                  |               |        |                 |                     |

ELI CREEK HARE EXCLOSURE

| Diameter<br>(cm) | balsam<br>fir | red<br>spruce | red<br>maple | DBH Class<br>Totals |
|------------------|---------------|---------------|--------------|---------------------|
| 2.0              | ----          | 165.29        | ----         | 165.29              |
| 4.0              | ----          | 330.58        | ----         | 330.58              |
| 6.0              | 330.58        | ----          | ----         | 330.58              |
| 8.0              | ----          | ----          | ----         | ----                |
| 10.0             | ----          | 165.29        | ----         | 165.29              |
| 12.0             | ----          | ----          | ----         | ----                |
| 14.0             | ----          | 165.29        | 165.29       | 330.58              |
| 16.0             | ----          | ----          | ----         | ----                |
| 18.0             | ----          | ----          | 165.29       | 165.29              |
| 20.0             | ----          | 165.29        | ----         | 165.29              |
| 22.0             | ----          | ----          | 330.58       | 330.58              |
| 24.0             | ----          | 330.58        | ----         | 330.58              |
| 26.0             | ----          | ----          | ----         | ----                |
| 28.0             | ----          | 165.29        | ----         | 165.29              |
| 30.0             | ----          | 165.29        | ----         | 165.29              |
| 32.0             | ----          | ----          | ----         | ----                |
| 34.0             | ----          | ----          | ----         | ----                |
| 36.0             | ----          | ----          | 165.29       | 165.29              |

|             |        |         |        |         |
|-------------|--------|---------|--------|---------|
|             |        |         |        |         |
| Species Sum | 330.58 | 1652.89 | 826.45 | 2809.92 |

ELI CREEK DEER AND HARE COMBINED DATA

| Diameter<br>(cm) | balsam<br>fir | red<br>spruce | cedar | red<br>maple | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|---------------|-------|--------------|-----------------|---------------------|
| 2.0              | ----          | 82.64         | ----  | ----         | 165.29          | 247.93              |
| 4.0              | ----          | 165.29        | ----  | ----         | 82.64           | 247.93              |
| 6.0              | 165.29        | 82.64         | ----  | ----         | ----            | 247.93              |
| 8.0              | ----          | ----          | ----  | ----         | ----            | ----                |
| 10.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 12.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 14.0             | ----          | 82.64         | ----  | 82.64        | ----            | 165.29              |
| 16.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 18.0             | ----          | ----          | ----  | 82.64        | ----            | 82.64               |
| 20.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 22.0             | ----          | 165.29        | ----  | 165.29       | ----            | 330.58              |
| 24.0             | ----          | 165.29        | 82.64 | ----         | ----            | 247.93              |
| 26.0             | ----          | ----          | ----  | ----         | ----            | ----                |
| 28.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 30.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 32.0             | ----          | ----          | ----  | ----         | ----            | ----                |
| 34.0             | ----          | ----          | ----  | ----         | ----            | ----                |
| 36.0             | ----          | ----          | ----  | 82.64        | ----            | 82.64               |
| Species Sum      | 165.29        | 1239.67       | 82.64 | 413.22       | 247.93          | 2148.76             |

ELI CREEK CONTROL

| Diameter<br>(cm) | red<br>spruce | cedar  | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|--------|-----------------|---------------------|
| 4.0              | 102.11        | ----   | ----            | 102.11              |
| 6.0              | ----          | ----   | ----            | ----                |
| 8.0              | 204.22        | ----   | ----            | 204.22              |
| 10.0             | ----          | ----   | ----            | ----                |
| 12.0             | 204.22        | 204.22 | 102.11          | 510.55              |
| 14.0             | ----          | ----   | ----            | ----                |
| 16.0             | 102.11        | 102.11 | ----            | 204.22              |
| 18.0             | ----          | 306.33 | ----            | 306.33              |
| 20.0             | ----          | 204.22 | ----            | 204.22              |
| 22.0             | ----          | 204.22 | ----            | 204.22              |
| 24.0             | ----          | 204.22 | ----            | 204.22              |
| 26.0             | 102.11        | ----   | 102.11          | 204.22              |

|             |         |         |        |         |
|-------------|---------|---------|--------|---------|
| 28.0        | 204.22  | 204.22  | ----   | 408.44  |
| 30.0        | ----    | ----    | ----   | ----    |
| 32.0        | ----    | ----    | ----   | ----    |
| 34.0        | ----    | ----    | ----   | ----    |
| 36.0        | ----    | ----    | ----   | ----    |
| 38.0        | 102.11  | ----    | ----   | 102.11  |
| Species Sum | 1021.10 | 1429.54 | 204.22 | 2654.85 |

LONG POND COMBINED DEER AND HARE EXCLOSURE DATA

| Diameter<br>(cm) | red<br>spruce | red<br>maple | yellow<br>birch | paper<br>birch | gray<br>birch | DBH Class<br>Totals |
|------------------|---------------|--------------|-----------------|----------------|---------------|---------------------|
| 2.0              | 341.88        | ----         | 170.94          | 1111.11        | ----          | 1623.93             |
| 4.0              | 85.47         | ----         | 85.47           | 1111.11        | 85.47         | 1367.52             |
| 6.0              | 85.47         | ----         | ----            | 1111.11        | 85.47         | 1282.05             |
| 8.0              | 341.88        | ----         | ----            | 256.41         | ----          | 598.29              |
| 10.0             | 256.41        | 85.47        | ----            | 683.76         | ----          | 1025.64             |
| 12.0             | 256.41        | ----         | ----            | 85.47          | ----          | 341.88              |
| 14.0             | 85.47         | ----         | ----            | ----           | ----          | 85.47               |
| 16.0             | 85.47         | ----         | ----            | ----           | ----          | 85.47               |
| 18.0             | 256.41        | ----         | ----            | ----           | ----          | 256.41              |
| Species Sum      | 1794.87       | 85.47        | 256.41          | 4358.97        | 170.94        | 6666.67             |

LONG POND DEER EXCLOSURE DATA

| Diameter<br>(cm) | red<br>spruce | paper<br>birch | DBH Class<br>Totals |
|------------------|---------------|----------------|---------------------|
| 2.0              | 277.78        | 833.33         | 1111.11             |
| 4.0              | 277.78        | 1388.89        | 1666.67             |
| 6.0              | 277.78        | 833.33         | 1111.11             |
| 8.0              | 833.33        | ----           | 833.33              |
| 10.0             | 833.33        | 1666.67        | 2500.00             |
| 12.0             | 833.33        | 277.78         | 1111.11             |
| 14.0             | ----          | ----           | ----                |
| 16.0             | 277.78        | ----           | 277.78              |
| 18.0             | 555.56        | ----           | 555.56              |

|             |         |         |         |
|-------------|---------|---------|---------|
| Species Sum | 4166.67 | 5000.00 | 9166.67 |
|-------------|---------|---------|---------|

LONG POND HARE EXCLOSURE DATA

| Diameter<br>(cm) | red<br>spruce | red<br>maple | yellow<br>birch | paper<br>birch | gray<br>birch | DBH Class<br>Totals |
|------------------|---------------|--------------|-----------------|----------------|---------------|---------------------|
| 2.0              | 370.37        | ----         | 246.91          | 1234.57        | ----          | 1851.85             |
| 4.0              | ----          | ----         | 123.46          | 987.65         | 123.46        | 1234.57             |
| 6.0              | ----          | ----         | ----            | 1234.57        | 123.46        | 1358.02             |
| 8.0              | 123.46        | ----         | ----            | 370.37         | ----          | 493.83              |
| 10.0             | ----          | 123.46       | ----            | 246.91         | ----          | 370.37              |
| 12.0             | ----          | ----         | ----            | ----           | ----          | ----                |
| 14.0             | 123.46        | ----         | ----            | ----           | ----          | 123.46              |
| 16.0             | ----          | ----         | ----            | ----           | ----          | ----                |
| 18.0             | 123.46        | ----         | ----            | ----           | ----          | 123.46              |
| Species Sum      | 740.74        | 123.46       | 370.37          | 4074.07        | 246.91        | 5555.56             |

LONG POND CONTROL DATA

| Diameter<br>(cm) | red<br>spruce | paper<br>birch | DBH Class<br>Totals |
|------------------|---------------|----------------|---------------------|
| 2.0              | 408.44        | ----           | 408.44              |
| 4.0              | 204.22        | ----           | 204.22              |
| 6.0              | 408.44        | ----           | 408.44              |
| 8.0              | 612.66        | ----           | 612.66              |
| 10.0             | 204.22        | ----           | 204.22              |
| 12.0             | ----          | ----           | ----                |
| 14.0             | 204.22        | ----           | 204.22              |
| 16.0             | 408.44        | ----           | 408.44              |
| 18.0             | 204.22        | ----           | 204.22              |
| 20.0             | ----          | ----           | ----                |
| 22.0             | ----          | 204.22         | 204.22              |
| 24.0             | ----          | ----           | ----                |
| 26.0             | 204.22        | ----           | 204.22              |
| 28.0             | ----          | ----           | ----                |
| 30.0             | ----          | ----           | ----                |
| 32.0             | ----          | ----           | ----                |
| 34.0             | ----          | ----           | ----                |
| 36.0             | ----          | ----           | ----                |
| 38.0             | ----          | 204.22         | 204.22              |

|             |         |        |         |
|-------------|---------|--------|---------|
| Species Sum | 2859.07 | 408.44 | 3267.51 |
|-------------|---------|--------|---------|

The differences between the 1991 data by (Saeki 1991) and our new data from 2002 is staggering at the Eli Creek exclosure. Saplings in our data include any small tree less than .5 meters. The data from 1991 included any sapling or small tree that could possibly be eaten by an animal. There might be more shrubs now because there are not as many creatures in the area feeding, or that our control plots were in different areas. The saplings numbers in 1991 at the Eli Creek site are very high. We suspect that a lot of those saplings are now trees, and these trees are not producing as many seeds as they did in the past. This is possible because of the drought like conditions we have had in the last 5 years, or unfavorable soil conditions. Table 1 clearly depicts the conditions in the past and how the exclosures are doing now. At the long pond site shrubbery and saplings are declining in numbers while the shrubs at the Eli Creek exclosure are increasing because of the bog like conditions.

Table 1  
Exclosure sapling and shrub comparison by plot

| Long Pond<br>Exclosure |             |     | Long Pond<br>Exclosure |             |    |
|------------------------|-------------|-----|------------------------|-------------|----|
| 2002                   |             |     | 1991                   |             |    |
| # of Saplings          | # of Shrubs |     | \$ of Saplings         | # of Shrubs |    |
| Deer                   | 0           | 3   | Deer+Hare              | 14          | 15 |
| Hare                   | 6           | 7   | Control                | 2           | 0  |
| Control                | 0           | 1   |                        |             |    |
| Eli Creek Exclosure    |             |     | Eli Creek Exclosure    |             |    |
| 2002                   |             |     | 1991                   |             |    |
| # of Saplings          | # of Shrubs |     | # of Saplings          | # of Shrubs |    |
| Deer                   | 13          | 30  | Deer+Hare              | 270         | 1  |
| Hare                   | 16          | 21  | Control                | 1632        | 0  |
| Control                | 88          | 147 |                        |             |    |

## Isle au Haute boundary lines



Prepared by:

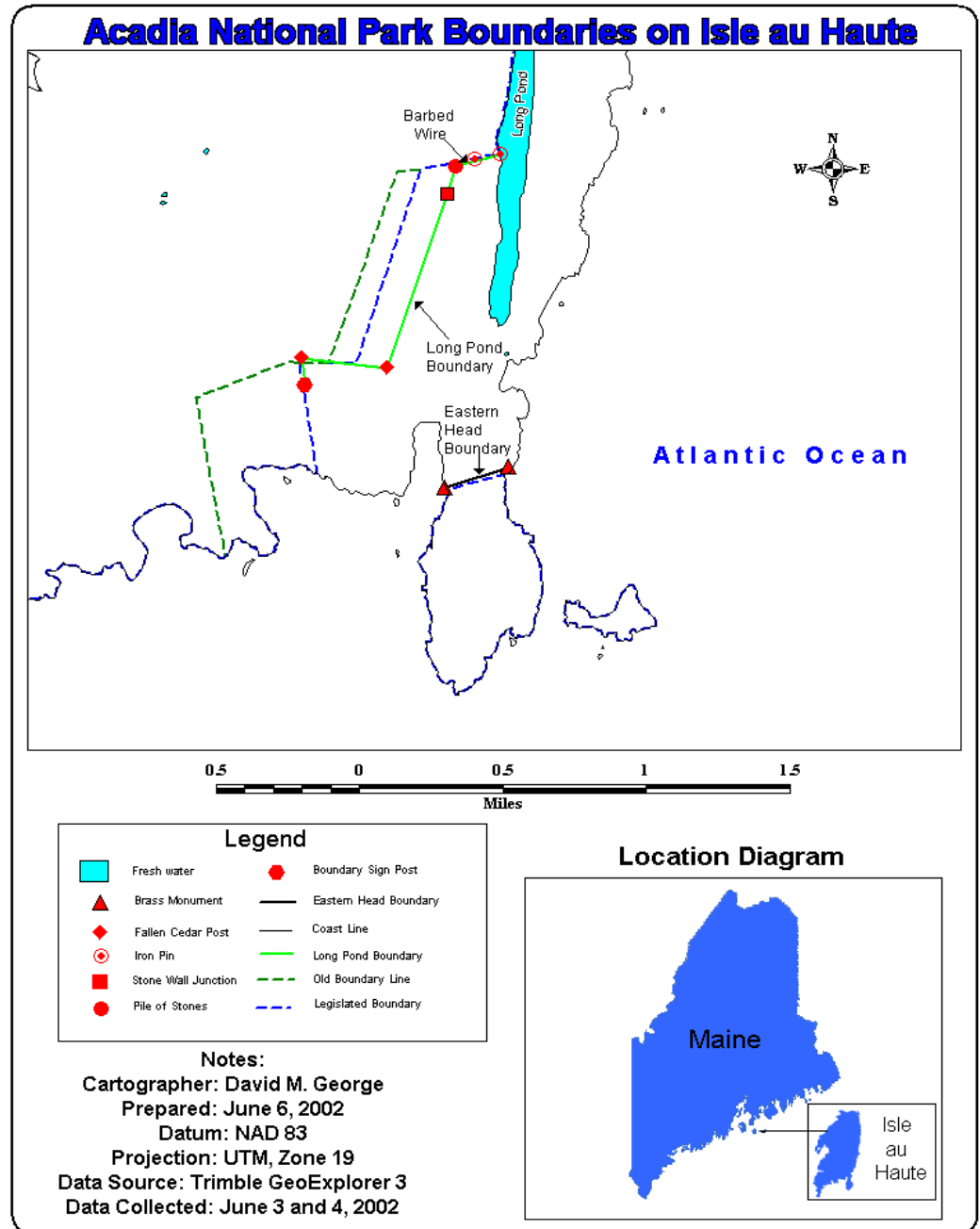
- Jeremiah Beach
- Maggie Burke
- Ross Congo
- David George

•TA: Richard Dorsett



# Map showing park boundaries

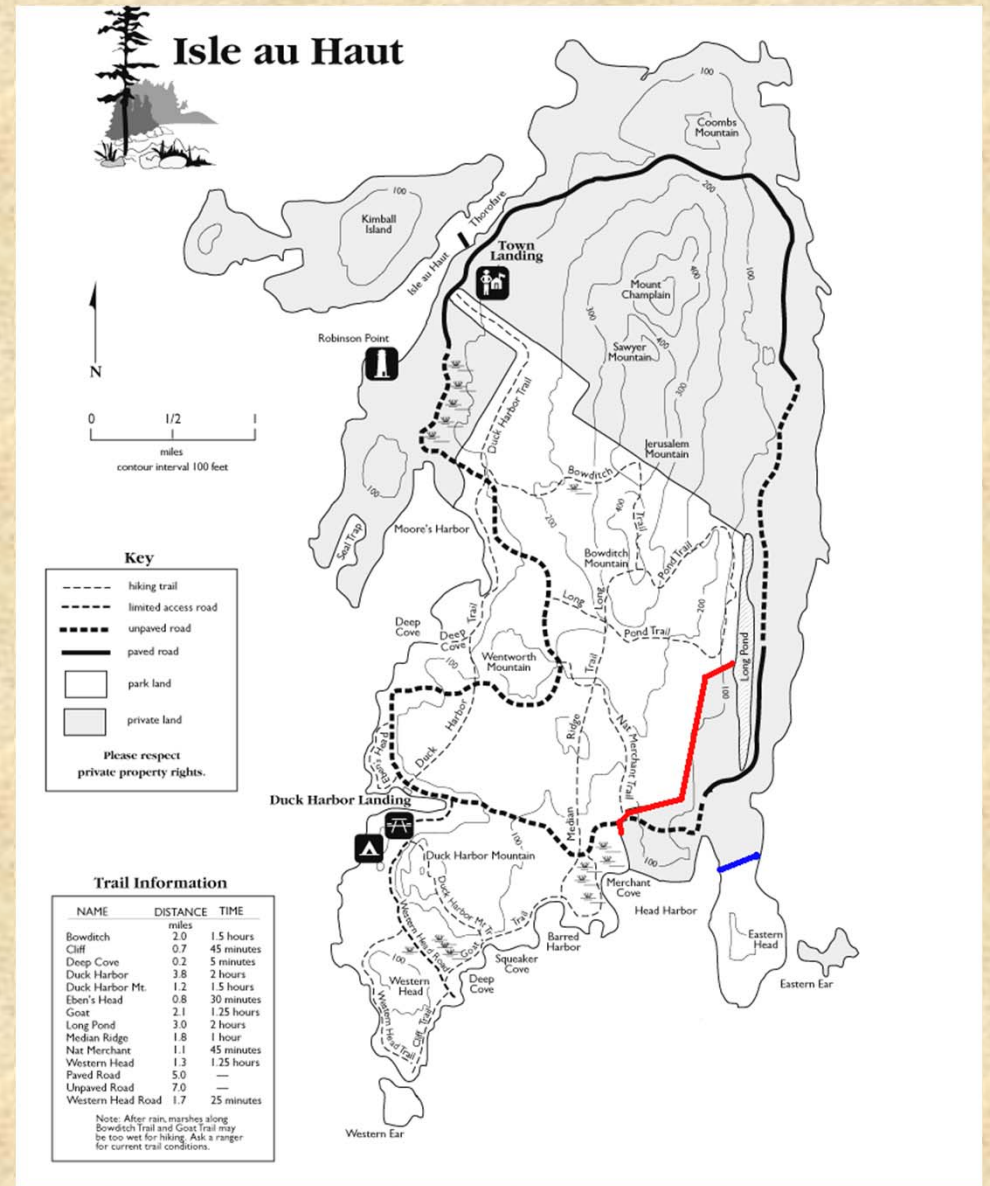
- Solid green line represents the Long Pond boundary
- Dashed blue line represents a legislated park boundary
- Dashed green line represents an old park boundary
- Solid black line represents East Head boundary line



# Eastern Head Boundary Line

In blue is the new Eastern Head boundary line, which is located in the southeast end of Isle au Haute.

- + Distance of this boundary was 0.23 miles (1,220 feet).
- + The two boundary monuments were three inch diameter brass plates set on bedrock by the Department of Interior.
- + On this end of the island there were many blow downs on the boundary line due to harsh conditions.



Blow downs on the east side...



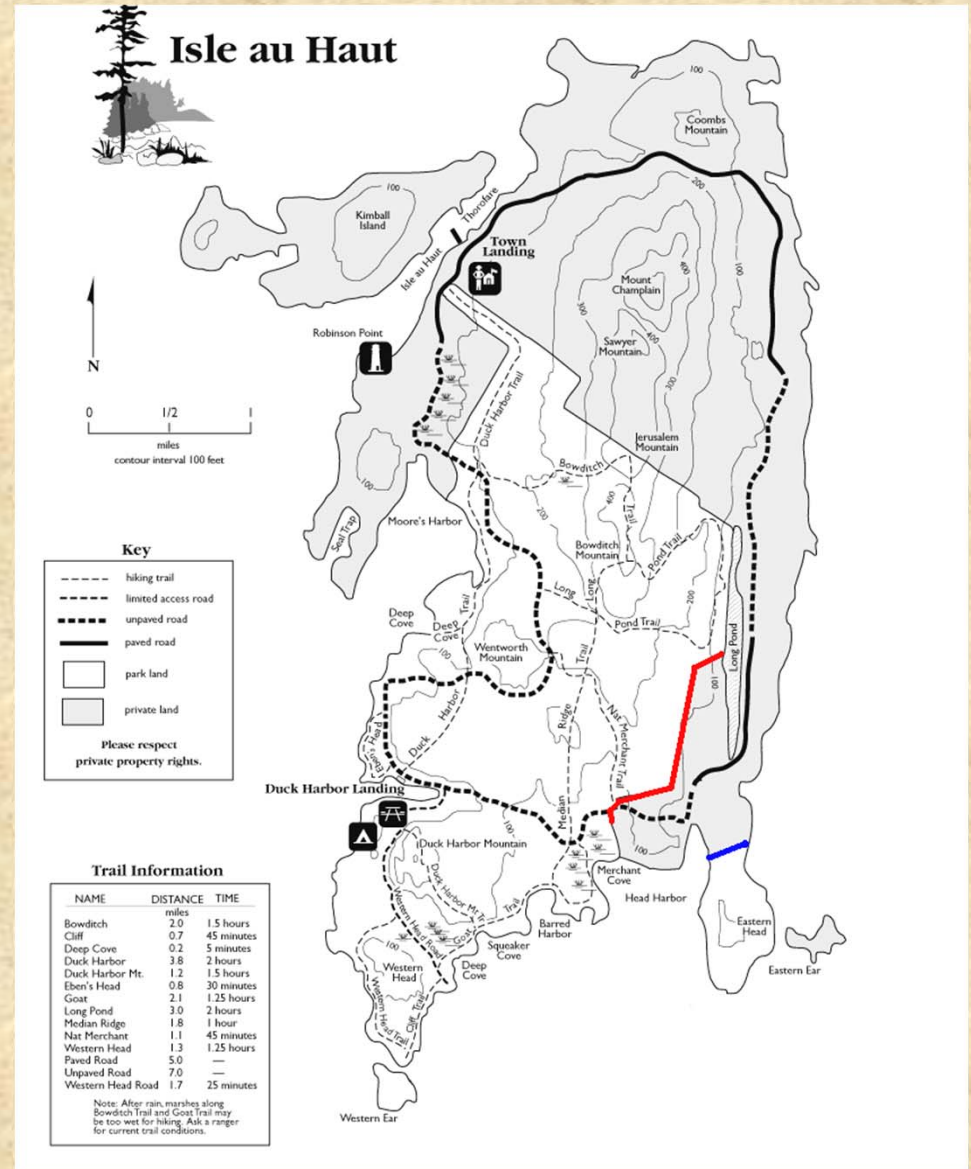
**BOUNDARY LINE MARKERS  
WERE HARD TO FIND DUE TO  
BLOW DOWNS**



# Long Pond Boundary Line

In red is the Long Pond boundary line, which is located in the southeast end of the island.

- + Distance of this boundary is 1.3 miles.
- + The boundary lines were marked in 3 corners with wooden posts that had fallen on the ground, the most northern section was made up of a stone wall.
- + The monument markers were government issued, rectangular in shape, and 2" x 12", that were placed sporadically in distance on the boundary line.





Corner post on the  
Long Pond Boundary  
line had fallen down,  
so we secured them  
to trees.

## Overgrown Boundary Line



# ...a possible solution

## ► Regular maintenance:

- ✓ Blaze more trees
- ✓ Mark with boundary line paint
- ✓ Permanent corner monuments
- ✓ GPS all monuments



# Special Thanks to:

- ☞ Louis Morin
- ☞ Al Kimball
- ☞ Dale Currier (Lil' Carnie)
- ☞ Mandy Farrar
- ☞ Ben Dow
- ☞ Richard Dorsett
- ☞ Acadia National Park
- ☞ Wayne Barter
- ☞ Tim Higgins



| Diameter<br>(cm) | red<br>spruce | cedar  | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|--------|-----------------|---------------------|
| 2.0              | ----          | ----   | 330.58          | 330.58              |
| 4.0              | ----          | ----   | 165.29          | 165.29              |
| 6.0              | 165.29        | ----   | ----            | 165.29              |
| 8.0              | ----          | ----   | ----            | ----                |
| 10.0             | ----          | ----   | ----            | ----                |
| 12.0             | 165.29        | ----   | ----            | 165.29              |
| 14.0             | ----          | ----   | ----            | ----                |
| 16.0             | 165.29        | ----   | ----            | 165.29              |
| 18.0             | ----          | ----   | ----            | ----                |
| 20.0             | ----          | ----   | ----            | ----                |
| 22.0             | 330.58        | ----   | ----            | 330.58              |
| 24.0             | ----          | 165.29 | ----            | 165.29              |
| Species Sum      | 826.45        | 165.29 | 495.87          | 1487.60             |

No Obvious  
difference!!!

### Eli Creek Hare Exclosure 2002

58 Percent Spruce

### Eli Creek Deer Exclosure 2002

55 Percent Spruce

| Diameter<br>(cm) | balsam<br>fir | red<br>spruce | red<br>maple | DBH Class<br>Totals |
|------------------|---------------|---------------|--------------|---------------------|
| 2.0              | ----          | 165.29        | ----         | 165.29              |
| 4.0              | ----          | 330.58        | ----         | 330.58              |
| 6.0              | 330.58        | ----          | ----         | 330.58              |
| 8.0              | ----          | ----          | ----         | ----                |
| 10.0             | ----          | 165.29        | ----         | 165.29              |
| 12.0             | ----          | ----          | ----         | ----                |
| 14.0             | ----          | 165.29        | 165.29       | 330.58              |
| 16.0             | ----          | ----          | ----         | ----                |
| 18.0             | ----          | ----          | 165.29       | 165.29              |
| 20.0             | ----          | 165.29        | ----         | 165.29              |
| 22.0             | ----          | ----          | 330.58       | 330.58              |
| 24.0             | ----          | 330.58        | ----         | 330.58              |
| 26.0             | ----          | ----          | ----         | ----                |
| 28.0             | ----          | 165.29        | ----         | 165.29              |
| 30.0             | ----          | 165.29        | ----         | 165.29              |
| 32.0             | ----          | ----          | ----         | ----                |
| 34.0             | ----          | ----          | ----         | ----                |
| 36.0             | ----          | ----          | 165.29       | 165.29              |
| Species Sum      | 330.58        | 1652.89       | 826.45       | 2809.92             |

## Long Pond Deer Exclosure 2002

45 Percent Spruce

| Diameter<br>(cm) | red<br>spruce | paper<br>birch | DBH Class<br>Totals |
|------------------|---------------|----------------|---------------------|
| 2.0              | 277.78        | 833.33         | 1111.11             |
| 4.0              | 277.78        | 1388.89        | 1666.67             |
| 6.0              | 277.78        | 833.33         | 1111.11             |
| 8.0              | 833.33        | ----           | 833.33              |
| 10.0             | 833.33        | 1666.67        | 2500.00             |
| 12.0             | 833.33        | 277.78         | 1111.11             |
| 14.0             | ----          | ----           | ----                |
| 16.0             | 277.78        | ----           | 277.78              |
| 18.0             | 555.56        | ----           | 555.56              |
| Species Sum      | 4166.67       | 5000.00        | 9166.67             |

## Long Pond Hare Exclosure 2002

13 Percent Spruce

| Diameter<br>(cm) | red<br>spruce | red<br>maple | yellow<br>birch | paper<br>birch | gray<br>birch | DBH Class<br>Totals |
|------------------|---------------|--------------|-----------------|----------------|---------------|---------------------|
| 2.0              | 370.37        | ----         | 246.91          | 1234.57        | ----          | 1851.85             |
| 4.0              | ----          | ----         | 123.46          | 987.65         | 123.46        | 1234.57             |
| 6.0              | ----          | ----         | ----            | 1234.57        | 123.46        | 1358.02             |
| 8.0              | 123.46        | ----         | ----            | 370.37         | ----          | 493.83              |
| 10.0             | ----          | 123.46       | ----            | 246.91         | ----          | 370.37              |
| 12.0             | ----          | ----         | ----            | ----           | ----          | ----                |
| 14.0             | 123.46        | ----         | ----            | ----           | ----          | 123.46              |
| 16.0             | ----          | ----         | ----            | ----           | ----          | ----                |
| 18.0             | 123.46        | ----         | ----            | ----           | ----          | 123.46              |
| Species Sum      | 740.74        | 123.46       | 370.37          | 4074.07        | 246.91        | 5555.56             |

## Eli Creek Combined Hare and Deer 2002

| Diameter<br>(cm) | balsam<br>fir | red<br>spruce | cedar | red<br>maple | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|---------------|-------|--------------|-----------------|---------------------|
| 2.0              | ----          | 82.64         | ----  | ----         | 165.29          | 247.93              |
| 4.0              | ----          | 165.29        | ----  | ----         | 82.64           | 247.93              |
| 6.0              | 165.29        | 82.64         | ----  | ----         | ----            | 247.93              |
| 8.0              | ----          | ----          | ----  | ----         | ----            | ----                |
| 10.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 12.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 14.0             | ----          | 82.64         | ----  | 82.64        | ----            | 165.29              |
| 16.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 18.0             | ----          | ----          | ----  | 82.64        | ----            | 82.64               |
| 20.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 22.0             | ----          | 165.29        | ----  | 165.29       | ----            | 330.58              |
| 24.0             | ----          | 165.29        | 82.64 | ----         | ----            | 247.93              |
| 26.0             | ----          | ----          | ----  | ----         | ----            | ----                |
| 28.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 30.0             | ----          | 82.64         | ----  | ----         | ----            | 82.64               |
| 32.0             | ----          | ----          | ----  | ----         | ----            | ----                |
| 34.0             | ----          | ----          | ----  | ----         | ----            | ----                |
| 36.0             | ----          | ----          | ----  | 82.64        | ----            | 82.64               |
| Species Sum      | 165.29        | 1239.67       | 82.64 | 413.22       | 247.93          | 2148.76             |

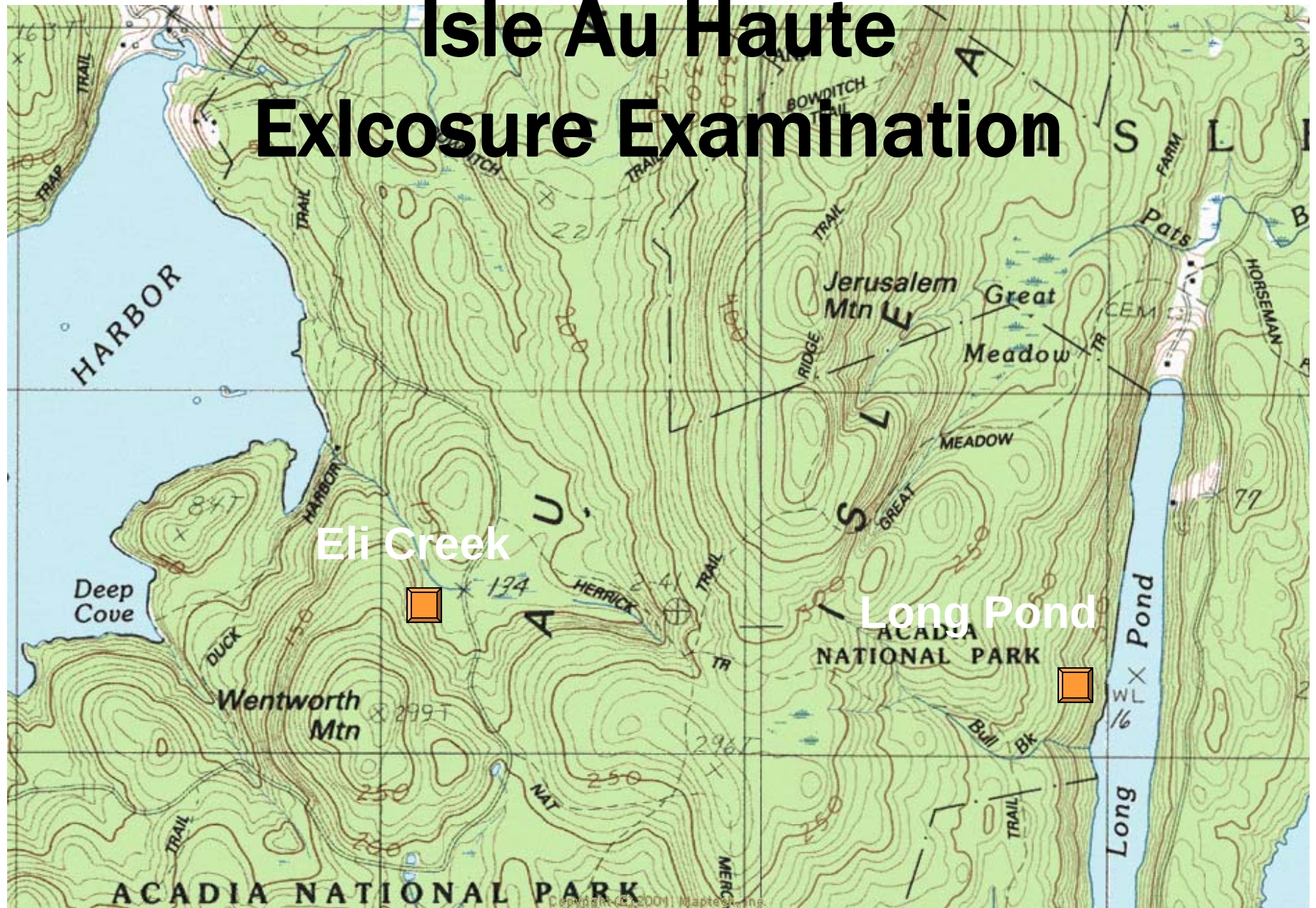
## Eli Creek Controls 2002

| Diameter<br>(cm) | red<br>spruce | cedar   | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|---------|-----------------|---------------------|
| 4.0              | 102.11        | ----    | ----            | 102.11              |
| 6.0              | ----          | ----    | ----            | ----                |
| 8.0              | 204.22        | ----    | ----            | 204.22              |
| 10.0             | ----          | ----    | ----            | ----                |
| 12.0             | 204.22        | 204.22  | 102.11          | 510.55              |
| 14.0             | ----          | ----    | ----            | ----                |
| 16.0             | 102.11        | 102.11  | ----            | 204.22              |
| 18.0             | ----          | 306.33  | ----            | 306.33              |
| 20.0             | ----          | 204.22  | ----            | 204.22              |
| 22.0             | ----          | 204.22  | ----            | 204.22              |
| 24.0             | ----          | 204.22  | ----            | 204.22              |
| 26.0             | 102.11        | ----    | 102.11          | 204.22              |
| 28.0             | 204.22        | 204.22  | ----            | 408.44              |
| 30.0             | ----          | ----    | ----            | ----                |
| 32.0             | ----          | ----    | ----            | ----                |
| 34.0             | ----          | ----    | ----            | ----                |
| 36.0             | ----          | ----    | ----            | ----                |
| 38.0             | 102.11        | ----    | ----            | 102.11              |
| Species Sum      | 1021.10       | 1429.54 | 204.22          | 2654.85             |

# **Isle Au Haute Exclosure Examination**

- **Following the 1947 Bar harbor fire an examination of the effects of deer browsing was undertaken by the National Park Service**
- **6 deer exclosures constructed, 1949-1968**
- **3 established in burned regions on MDI**
- **2 established in unburned regions on Isle Au Haut**
- **Both plots on IH measured 12m x 12m**

# Isle Au Haute Exlcosure Examination



# Isle Au Haute

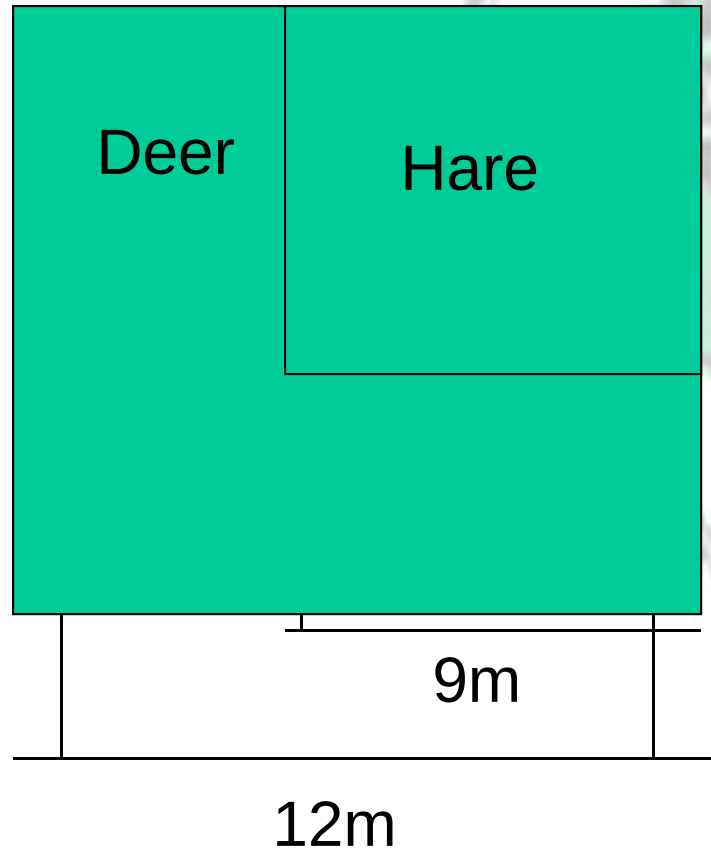
## Exclosure Examination

- Inventory was sorted by species based on the following criteria
  - Trees-woody stems greater than 2 meters in height
  - Shrubs-woody stems 0.5 to 2 meters in height
  - Saplings-woody stems less than 0.5 meters in height

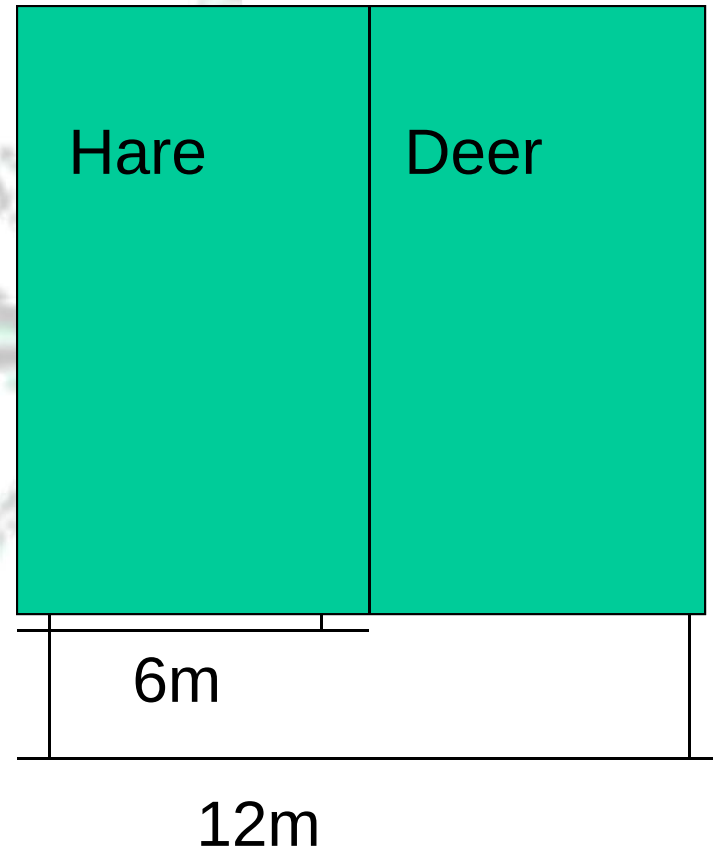
# Isle Au Haute

## Exclosure Examination

Long Pond



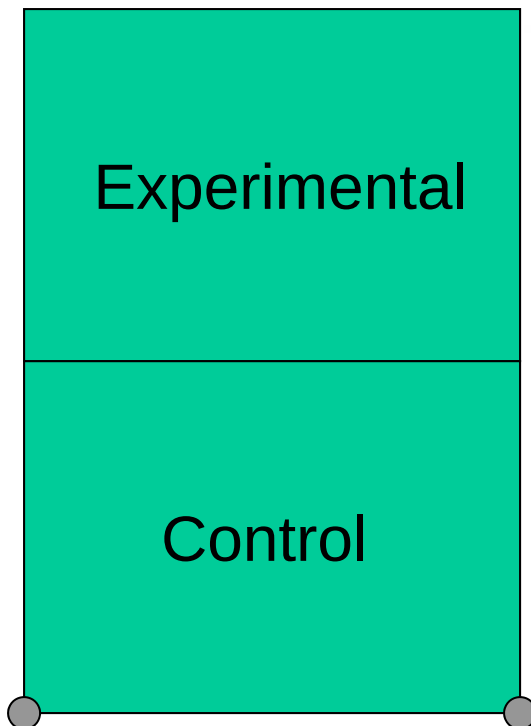
Eli Creek



# Isle Au Haute

## Exclosure Examination

- Control Plots were established adjacent to the experimental plots, using these stakes as guides at the Long Pond site



# Isle Au Haute Exclosure Examination



This grazed shrubbery  
and the whitetails  
visible throughout the  
island serve as  
examples of why the  
study is necessary



# Isle Au Haute Exclosure Examination

Long Pond 2002



Long Pond 1976



# Isle Au Haute

## Exclosure Examination



| Long Pond                  |      |      |
|----------------------------|------|------|
|                            | 1973 | 2002 |
| Birch in Deer Exclosure    | 10   | 2    |
| Birch in Hare Exclosure    | 10   | 12   |
| PER HECTARE DEER EXCLOSURE | 1235 | 247  |
| PER HECTARE HARE EXCLOSURE | 1852 | 2222 |

# Isle Au Haute

## Exclosure Examination

| TOTAL TREE EXCLOSURE DATA |           |              |           |              |           |              |
|---------------------------|-----------|--------------|-----------|--------------|-----------|--------------|
| LONG POND                 | 1973      |              | 1990      |              | 2002      |              |
|                           | EXCLOSURE | STEMS PER HA | EXCLOSURE | STEMS PER HA | EXCLOSURE | STEMS PER HA |
| BIRCH                     | 20        | 2087         | 110       | 11479        | 14        | 2469         |
| SPRUCE                    | ?         | ?            | 26        | 2713         | 13        | 1794         |
| <b>ELI CREEK</b>          |           |              |           |              |           |              |
| BIRCH                     | 20        | 1389         | 0         | 0            | 0         | 0            |
| SPRUCE                    | ?         | ?            | 12        | 833          | 15        | 1042         |

| Diameter<br>(cm) | red<br>spruce | cedar  | black<br>cherry | DBH Class<br>Totals |
|------------------|---------------|--------|-----------------|---------------------|
| 2.0              | ----          | ----   | 330.58          | 330.58              |
| 4.0              | ----          | ----   | 165.29          | 165.29              |
| 6.0              | 165.29        | ----   | ----            | 165.29              |
| 8.0              | ----          | ----   | ----            | ----                |
| 10.0             | ----          | ----   | ----            | ----                |
| 12.0             | 165.29        | ----   | ----            | 165.29              |
| 14.0             | ----          | ----   | ----            | ----                |
| 16.0             | 165.29        | ----   | ----            | 165.29              |
| 18.0             | ----          | ----   | ----            | ----                |
| 20.0             | ----          | ----   | ----            | ----                |
| 22.0             | 330.58        | ----   | ----            | 330.58              |
| 24.0             | ----          | 165.29 | ----            | 165.29              |
| Species Sum      | 826.45        | 165.29 | 495.87          | 1487.60             |

**No Obvious  
difference!!!**

## Eli Creek Hare Exclosure 2002

**58 Percent Spruce**

## Eli Creek Deer Exclosure 2002

**55 Percent Spruce**

| Diameter<br>(cm) | balsam<br>fir | red<br>spruce | red<br>maple | DBH Class<br>Totals |
|------------------|---------------|---------------|--------------|---------------------|
| 2.0              | ----          | 165.29        | ----         | 165.29              |
| 4.0              | ----          | 330.58        | ----         | 330.58              |
| 6.0              | 330.58        | ----          | ----         | 330.58              |
| 8.0              | ----          | ----          | ----         | ----                |
| 10.0             | ----          | 165.29        | ----         | 165.29              |
| 12.0             | ----          | ----          | ----         | ----                |
| 14.0             | ----          | 165.29        | 165.29       | 330.58              |
| 16.0             | ----          | ----          | ----         | ----                |
| 18.0             | ----          | ----          | 165.29       | 165.29              |
| 20.0             | ----          | 165.29        | ----         | 165.29              |
| 22.0             | ----          | ----          | 330.58       | 330.58              |
| 24.0             | ----          | 330.58        | ----         | 330.58              |
| 26.0             | ----          | ----          | ----         | ----                |
| 28.0             | ----          | 165.29        | ----         | 165.29              |
| 30.0             | ----          | 165.29        | ----         | 165.29              |
| 32.0             | ----          | ----          | ----         | ----                |
| 34.0             | ----          | ----          | ----         | ----                |
| 36.0             | ----          | ----          | 165.29       | 165.29              |
| Species Sum      | 330.58        | 1652.89       | 826.45       | 2809.92             |

| Diameter (cm) | red spruce | paper birch | DBH Class Totals |
|---------------|------------|-------------|------------------|
| 2.0           | 277.78     | 833.33      | 1111.11          |
| 4.0           | 277.78     | 1388.89     | 1666.67          |
| 6.0           | 277.78     | 833.33      | 1111.11          |
| 8.0           | 833.33     | ----        | 833.33           |
| 10.0          | 833.33     | 1666.67     | 2500.00          |
| 12.0          | 833.33     | 277.78      | 1111.11          |
| 14.0          | ----       | ----        | ----             |
| 16.0          | 277.78     | ----        | 277.78           |
| 18.0          | 555.56     | ----        | 555.56           |
| Species Sum   | 4166.67    | 5000.00     | 9166.67          |

## Long Pond Deer Exclosure 2002

45 Percent Spruce

## Long Pond Hare Exclosure 2002

13 Percent Spruce

| Diameter (cm) | red spruce | red maple | yellow birch | paper birch | gray birch | DBH Class Totals |
|---------------|------------|-----------|--------------|-------------|------------|------------------|
| 2.0           | 370.37     | ----      | 246.91       | 1234.57     | ----       | 1851.85          |
| 4.0           | ----       | ----      | 123.46       | 987.65      | 123.46     | 1234.57          |
| 6.0           | ----       | ----      | ----         | 1234.57     | 123.46     | 1358.02          |
| 8.0           | 123.46     | ----      | ----         | 370.37      | ----       | 493.83           |
| 10.0          | ----       | 123.46    | ----         | 246.91      | ----       | 370.37           |
| 12.0          | ----       | ----      | ----         | ----        | ----       | ----             |
| 14.0          | 123.46     | ----      | ----         | ----        | ----       | 123.46           |
| 16.0          | ----       | ----      | ----         | ----        | ----       | ----             |
| 18.0          | 123.46     | ----      | ----         | ----        | ----       | 123.46           |
| Species Sum   | 740.74     | 123.46    | 370.37       | 4074.07     | 246.91     | 5555.56          |

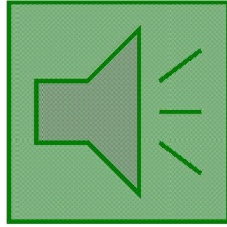
**Gordon Bok** is a folk singer/guitarist who has been referred to as "The Voice of the Maine Seacoast." On his album A Tune for November there is a song called *The Hills of Isle au Haut* which is sure to strike a chord in fans of the island.

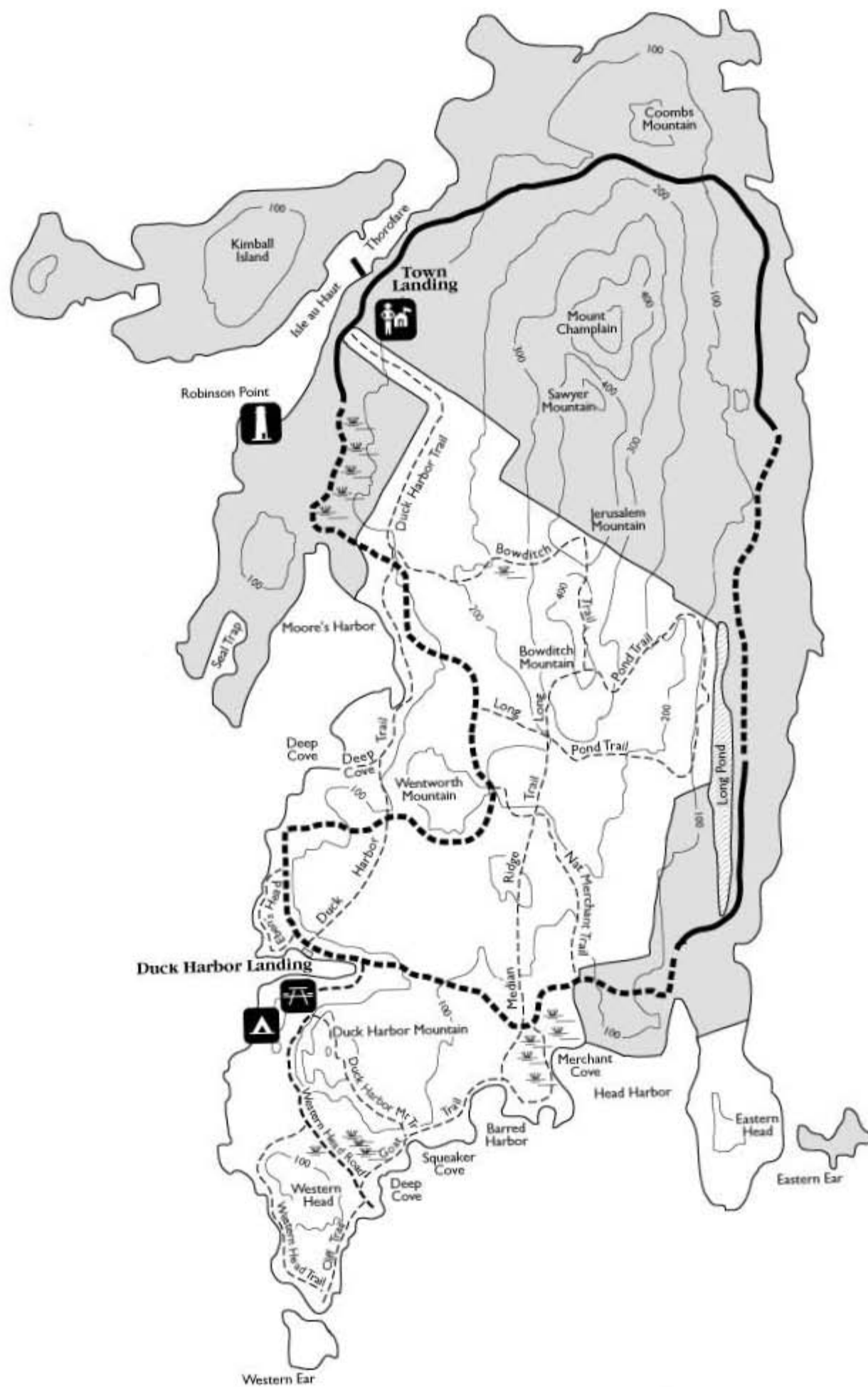
***"The winters drive you crazy, and the fishing's hard and slow,  
You're a damned fool if you stay, but there's no better place to go..."***

Also by Gordon Bok, from the album Turning Toward the Morning, is a song called *Isle au Haut Lullaby (Hay Ledge Song)*. Performed with Ann Muir and Ed Trickett, this song is very sweet and touching.

***"If I could give you three things, I would give you these:  
Song and laughter and a wooden home, in the shining sea.***

***When you see old Isle au Haut, rising in the dawn,  
You will play in yellow fields, in the morning sun."***





# ISLE AU HAUT



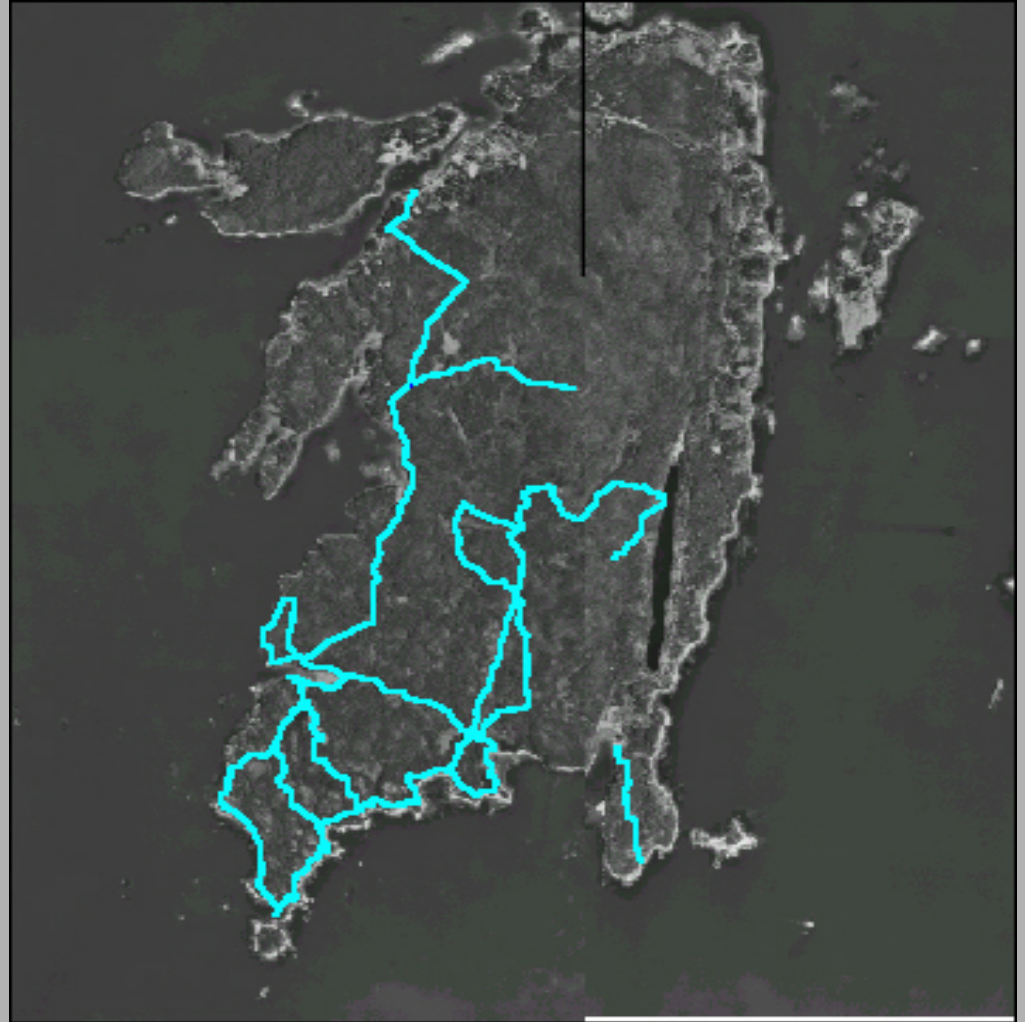
# Introduction

- Arrived with intent of marking pre-existing trails
- Trimble Pro XR, and Geo Explorer 3 were used
- Compared results with the existing data



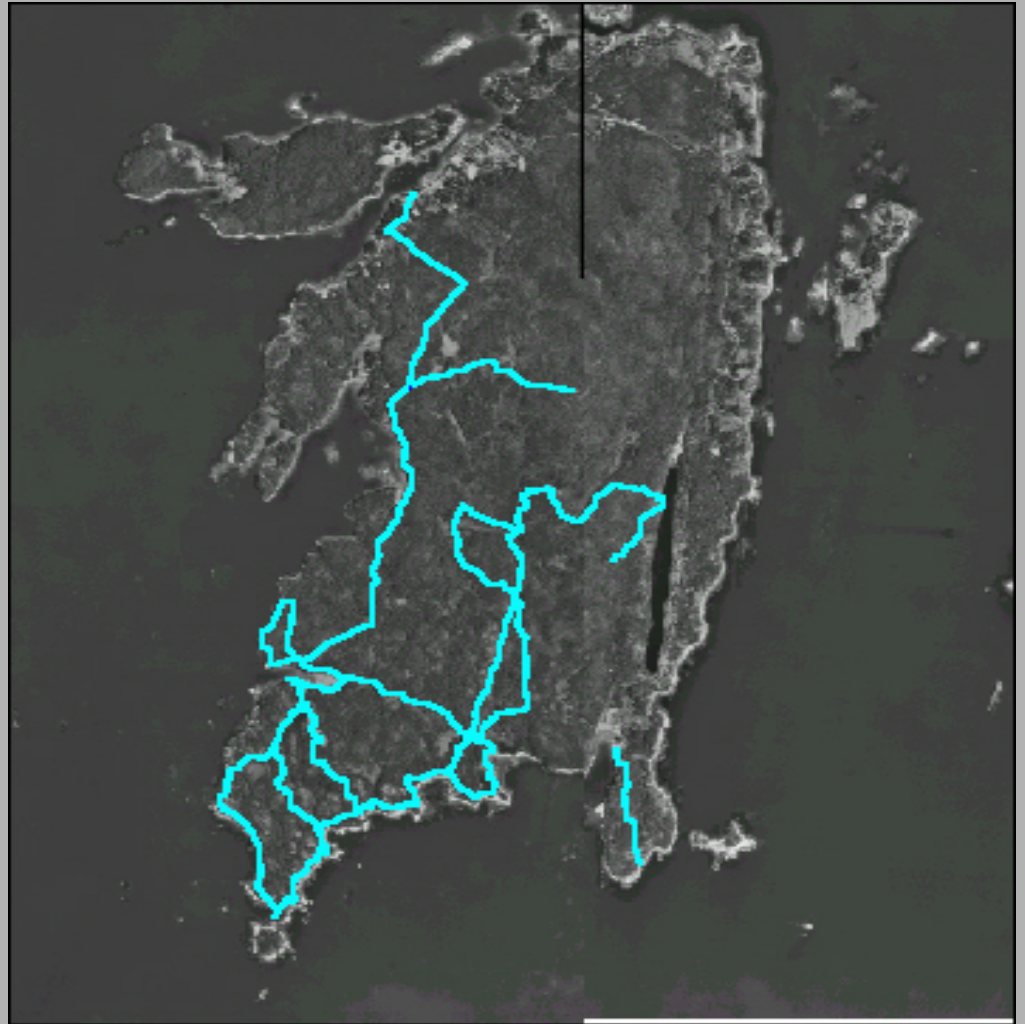
# Coastal Trails

- Duck Harbor Trail
- Eben's Head Trail
- Cliff Trail
- Goat Trail
- Eastern Head Trail



# Interior Trails

- Long Pond Trail
- Deep Cove Trail
- Median Ridge Trail
- Nat Merchant Trail
- Duck Harbor Mt. Trail
- Bowditch Trail



# Trail Conditions

- Well maintained and used
- Recently improved
  - Mount Desert Island Trail Crew
  - New blazes – Long Pond, Bowditch
- Eastern Head Trail not marked
- Lack of blazing
  - Duck Harbor Mt trail
  - Goat trail



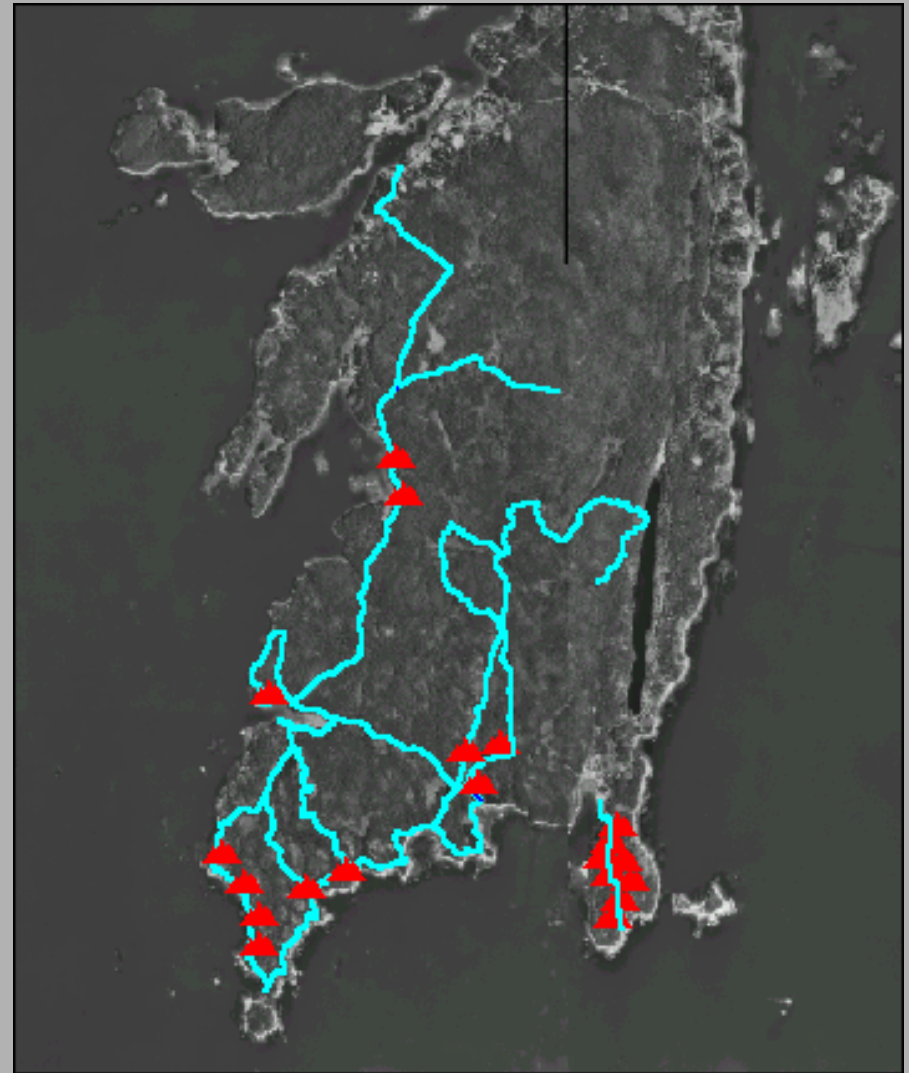
# Stand Conditions

- Large fuel loads
  - Blow-downs across trails
  - Hinder access
- Composed mainly of spruce
  - Low quality caused by poor soil or lack of
- Caused by rot and decay
- Poor stand quality
- Unmanaged for years



# Fuel Loading Around Trails

- Each flame indicates dangerous fuel loading
  - Witches brooms
  - Ladder fuels
  - Blow downs
- Interior unseen
  - Could be worse
- Eastern head hot spot



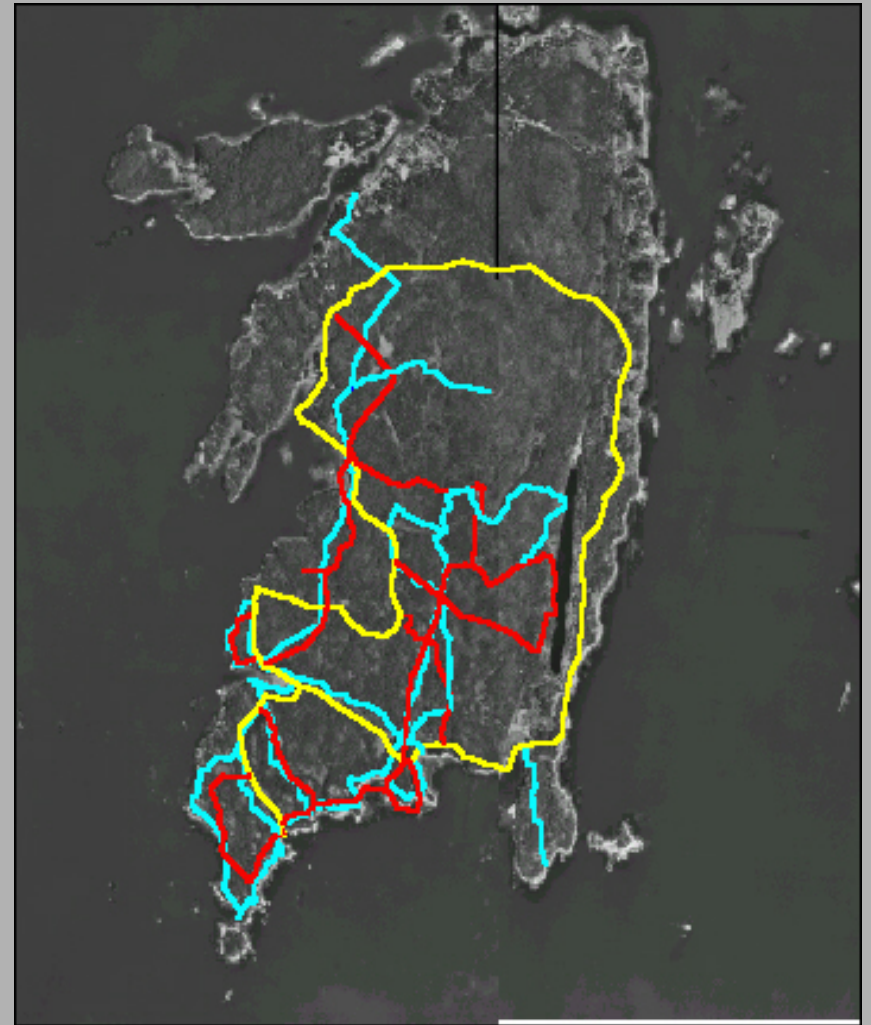
# Campground conditions

- Luxurious new facilities!
- Scenic area
- Animal boxes preventing food theft (red squirrels)
- Easily accessible by boat or road
- Possible problem
  - Fire rings close to lean-tos
  - Fire on an island with an extreme fuel load



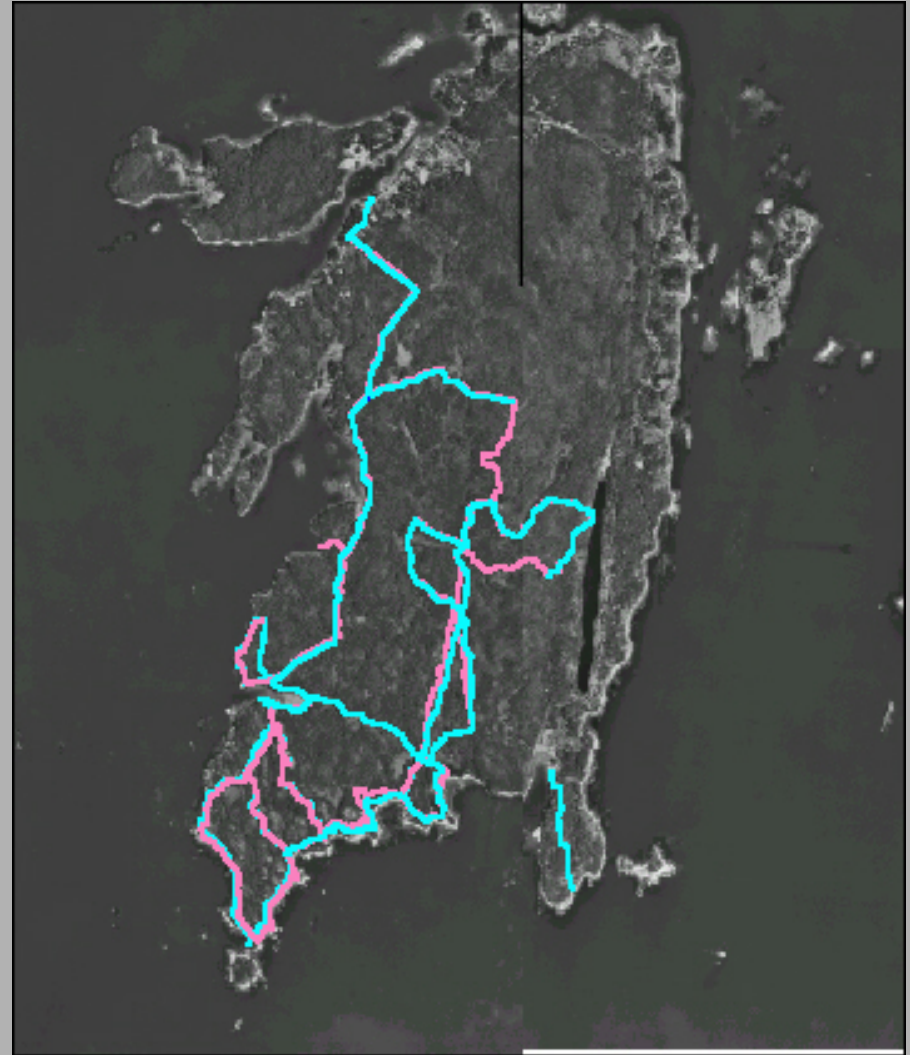
# Student Mapped Trails vs. Visitor Map

- Visitor map was inaccurate compared to GPS mapping done by University of Maine Students.
- Possible reasons?
  - Less accurate instrumentation
  - Insufficient data collection
  - Actual methods used
  - Map not to scale
- GPS mapping systems used by students extremely accurate



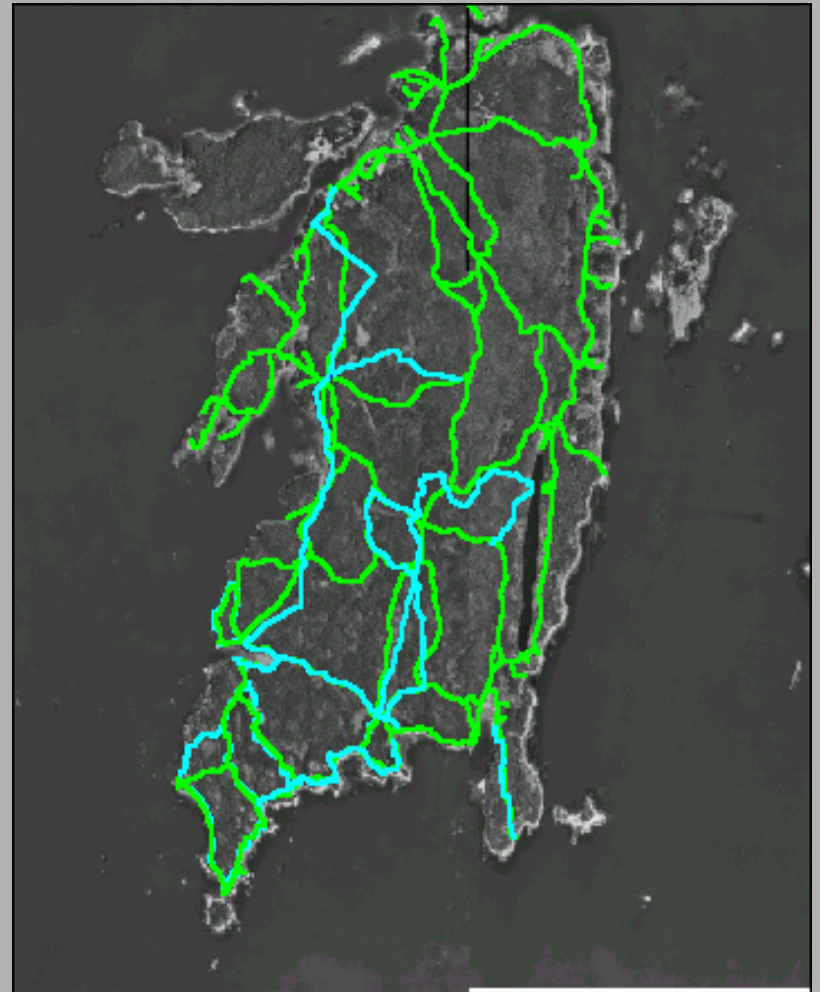
# GPS vs. Compass and Chain Mapped Trails

- GPS and previous compass mapping most similar
- Causes?
  - Both done on site



# Student Mapped Trails vs NPS Mapped Trails

- Similar but different
- Causes?
  - Not sure of how data was collected
  - Survey Maps
    - Traced over map created inaccuracy and error

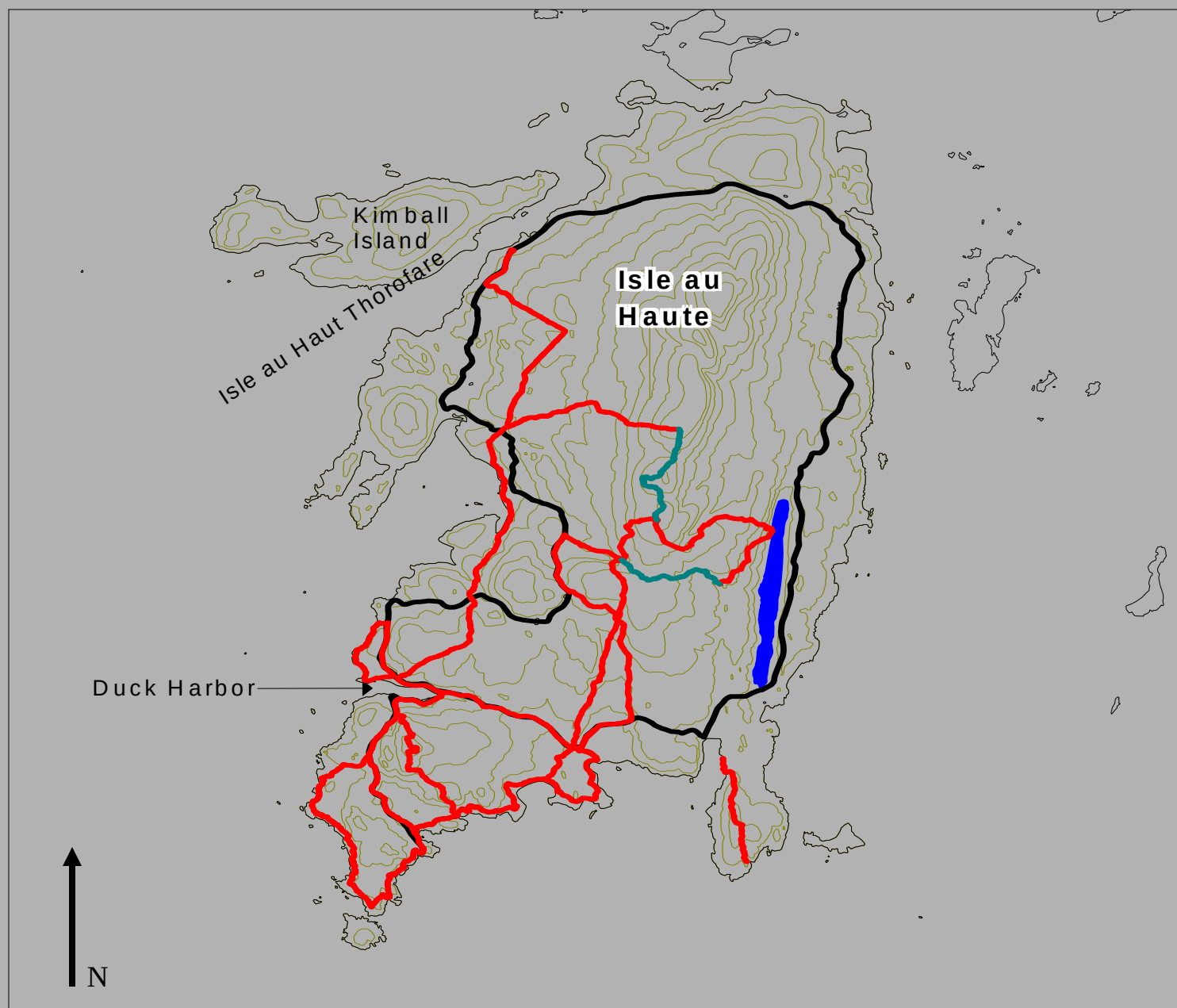


# Recommendations

- Continuation of annual trail work done by MDI crew
  - Re-blazing
  - Clearing Debris and Tinder
  - Trash and lobster buoy clean-up on coast

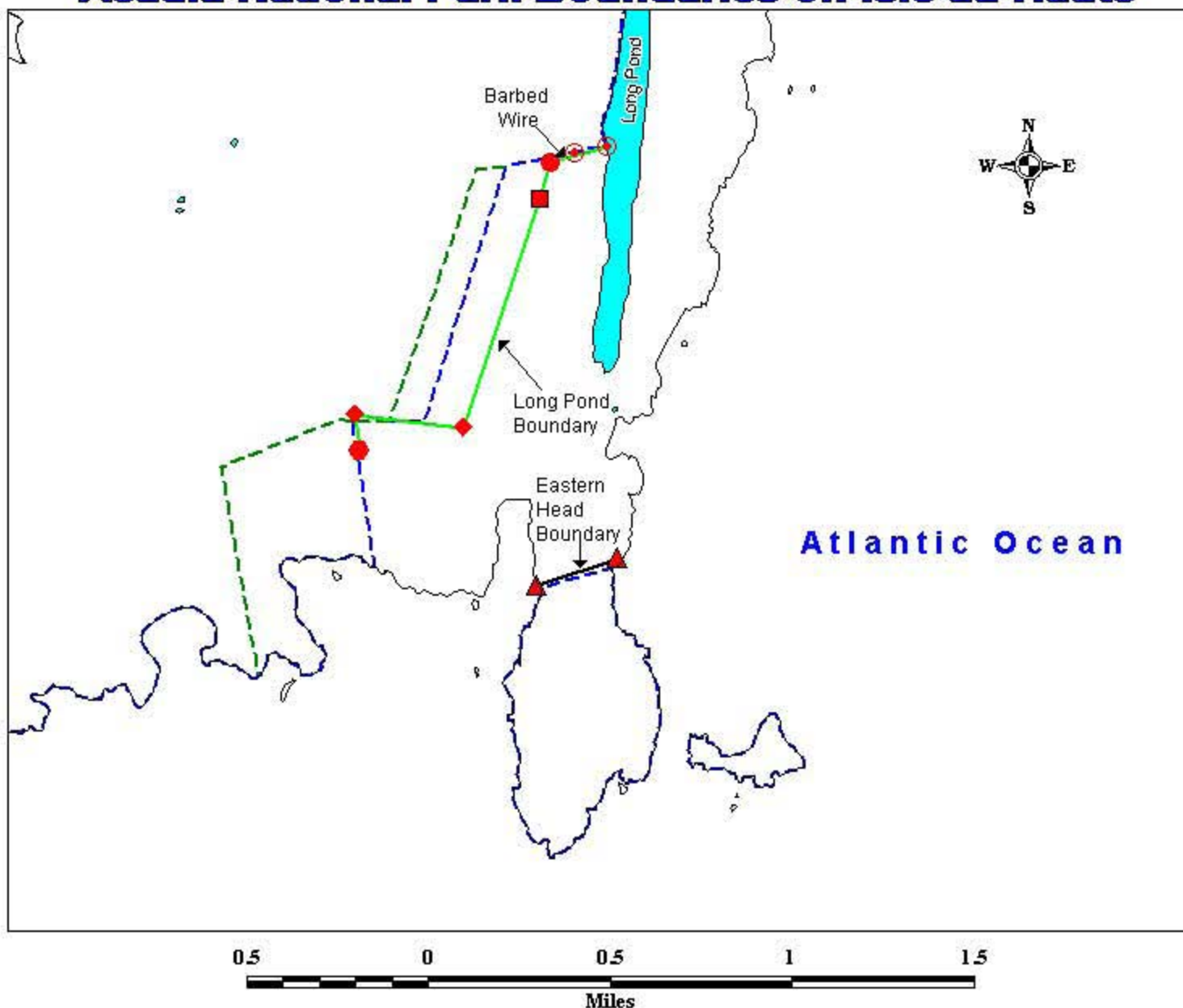
# Recommendations

- Ranking for trails
  - E.G. Hard, moderate, easy
    - Rankings should be based on roughness and remoteness of the area
    - Safety reasons
- Moving fire rings away from lean-tos
  - High fuel loads on island





# Acadia National Park Boundaries on Isle au Haute



## Legend

- |                                                                                     |                     |                                                                                     |                       |
|-------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------|
|  | Fresh water         |  | Boundary Sign Post    |
|  | Brass Monument      |  | Eastern Head Boundary |
|  | Fallen Cedar Post   |  | Coast Line            |
|  | Iron Pin            |  | Long Pond Boundary    |
|  | Stone Wall Junction |  | Old Boundary Line     |
|  | Pile of Stones      |  | Legislated Boundary   |

## Notes:

Cartographer: David M. George  
 Prepared: June 6, 2002  
 Datum: NAD 83  
 Projection: UTM, Zone 19  
 Data Source: Trimble GeoExplorer 3  
 Data Collected: June 3 and 4, 2002

## Location Diagram

