

G.I.S.: GPS and Digital Images of Acadia's Vistas

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Created by Crew Two; Forestry Summer Camp

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Summary

Project 1: Working within Acadia National Park, in conjunction with the Maintenance and Natural Resources divisions, our crew's initial and primary project was to establish a layout of digital images. The focus of these images was the intended views from each specific vista opening. The goal is to create base line data for future vista prescriptions and follow-up management. This first required the establishment of permanent photo points of each view. Crews 1 and 3 assisted in gathering this information.

Project 2: An additional assignment consisted of creating a G.I.S. layout of a proposed project on Baker Island by using Trimble Navigation Pro XL and Pro XR receivers. This included GPS'ing the boundary line, shoreline, road, and buildings. The projects goal is aimed at restoring a portion of the island's landscape to that which

resembles the pre-1950's and to facilitate an environmental impact study of such a project. Crew four was assigned this task and was transported via boat to the island to collect the data.

Planning and Coordination

Our crew was charged with identifying our objectives, and developing a plan of action. Our initial priority was to create guidelines for the other crews. Using MapInfo, we produced larger scale maps of vista locations and instructions to assist the other crews in collecting data. We began with the vistas that the previous summer camp students had worked on and, with the aid of Linda Gregory, the Natural Resources division representative, we added other priority vista sites. We coordinated the precise location of the vistas with Jeff Gray, Maintenance division representative, and Linda. Our crew was lead by Victoria Hansen, who was well versed in both MapInfo and GPS. Once our day of fieldwork was finished, our main objective became organizing the other crews and the information they presented to us.

Execution

Several different methods were used for data collection involving the use of the following electronic devices: Trimble Navigation Pro XL and Pro XR GPS receivers, a simple data dictionary, a Kodak Digital Camera, and computer programs MapInfo and PathFinder Office. The following equipment were also used: yellow-capped rebars, a hammer, wooden stakes, flagging and a magic marker, a compass, and a notebook. All of

these supplies were combined with one another enabling crews to collect GPS and photo point data at various vista locations, along several of the carriage roads, and on Baker Island.

The first phase was for our crew to transit the carriage road system while being escorted by Acadia National Park's Jeff Grey. He helped us locate the eleven vistas (numbers 8, 19, 25, 53, 65, 87, 89, 94, 132, 149, and 170) that were to have GPS and photo points taken by the other crews. These crews were to be under our direction for this exercise. While we were exploring the vistas and carriage roads we stopped at the brush saw site, located at Sargent Mountain (vista number 132), to record "before" photos of the vista. The photographs were taken using the Kodak Digital Camera. To complete this process three photo points were chosen by deciding which points would have the best scenic view. Once the points were selected, a yellow-capped rebar was driven into the ground at an inconspicuous place along the side of the carriage road. The Pro XL GPS receiver was used to collect all of the GPS data at the three separate points. While one of the crewmembers was collecting GPS information, another crewmember was taking photographs of the intended view. A compass was used to measure the azimuth of the camera view from the rebar, for future identification. This information was then recorded in the notebook along with notes on the date, time, photo numbers, GPS file names, and a description of the view from each point. Next we proceeded to continue to the other vistas.

The second phase was to locate specific vistas where the other crews would be collecting GPS and photo points. To do this we first located a vista. We then set up stakes with flagging on them at the points where the information was to be taken. The site was

then given a name such as "Jordan Pond" or "Wildwood", the chosen name was then written on the flagging. Again, we recorded the azimuth and a description of the view from each stake. We did this to make finding each stake easy for the crew that was to finish gathering data at that point. This step was repeated for the remaining nine vistas.

On Baker Island, information was collected using a slightly different method than what was previously used. The same basic format was used, but a second GPS unit was added, the Pro XR. Instead of gathering data on various vista sites a perimeter of the parks boundary on the island was mapped by using the two GPS units. This was done by braking the eight person crew down into two crews of four and then having one of the crews GPS the shore line while the other one was taking GPS information along the park's boundry. They also took down information (the same way as previously stated in step two) on several of Baker Island's features, such as buildings, apple trees, trails, and a lighthouse.

Raw and post-processed GPS information was then stored and processed using the computer programs MapInfo and PathFinder Office. Using the Trimble Navigation Pro XL and the Pro XR made it easy to take the collected data and download it onto the computer. PathFinder Office was used to transfer the GPS files out of the data dictionary and GPS unit to the computer so that it could then be used to produce maps (using MapInfo) and other valuable material. The first instance of this took place on Tuesday May 21, 1997. After a day of taking photo points and pounding re-bar our group headed to Park Headquarters. Here we took the GPS data and the digital photos and loaded it into the Park's computer. Once the information was viewed on the computer it was all downloaded onto a floppy disk for transfer to office computers. This process made it

easy for our group to return to the camp and review all of the data we had collected. In the days that followed each group collected more data and went through the same process of downloading the data onto a disk and then loading it in to our data base. This process made it easy for our group to view the progress as it continued over the week.. Over all the post processing work went smoothly and benefited our group greatly.

CONCLUSION

The digital pictures and GPS data we collected in Acadia will provide vital information to the NPS on the vistas located along the carriage roads. NPS worker Linda Gregory along with our professors and teaching assistants were instrumental to this project in helping us select exactly where our data points should be taken. We decided to take all of our data from the corner points of the vistas to give us the best possible information and a consistency in our readings. Having a constant method of taking information in this activity was very important because four different groups partook in it on four different days. After completing this exercise all students attending Forestry Summer Camp were able to competently use hand-held GPS receivers to plot points and digital cameras for before and after pictures. The findings of this project should be helpful to both the University of Maine Forestry department and the NPS as well as a valuable learning experience to those students who attended Forestry Summer Camp.

Discussions and Recommendations

These are a few recommendations or comments that were a result of this year's experimental GIS project. With any initial project there are bound to be planning discrepancies and not wanting to break with tradition we followed through with a few of our own. The following are suggestions for subsequent data collection.

- 1) A clear objective(s) so that the groups responsibility is accurately defined.**
- 2) An itemized list of actual vista numbers to be surveyed would eliminate some of the guesswork in identifying vista openings. (Note: If possible, the assistance of a Park representative would facilitate this as well.)**
- 3) The group responsible for the project should brief the data collecting group thoroughly before each day to reduce confusion.**
- 4) We have attached a recommended data sheet, which should standardize data collection. (Improvements are welcomed!)**
- 5) Once the rebar photo points are in place on the outside edge of the coping stones we recommend that each photo should be taken in the center of the road adjacent to the rebar. (This should be standardized for all photos)**
- 6) After each day of data collection the images, photo points, roads, and vista polygons should be reviewed to ensure accuracy. Having a member(s) present from each specific day would help this process.**

AREA DESIGNATED FOR GPS MAP

Photo Point Information

Point Designation	Azimuth of Photo	Photo Number	Description of Photo	UTM Coordinate

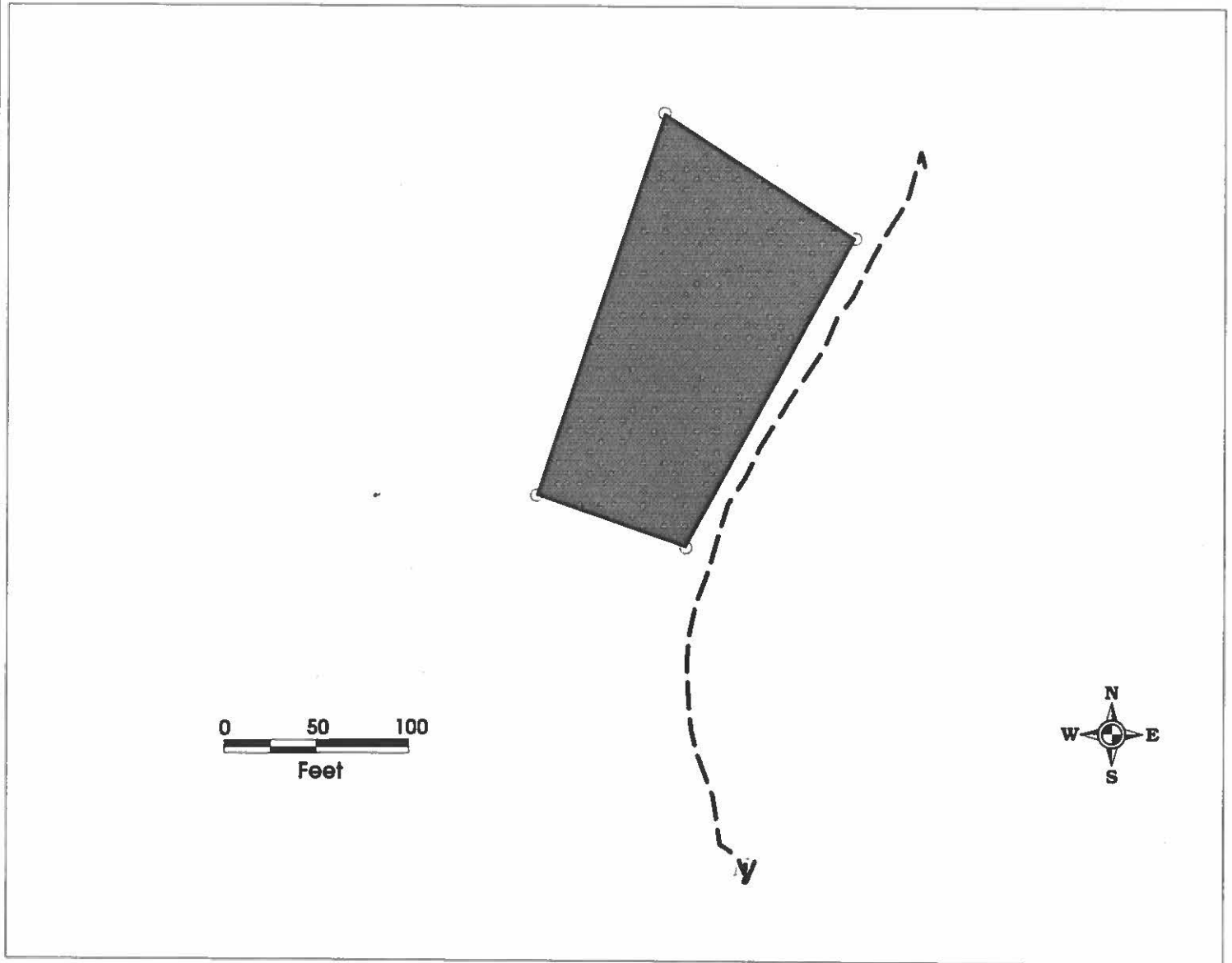
GPS Information

[illegible]

GPS Road Information

[illegible]

***Acadia National Park
Mount Desert Island, Maine
Carriage Road Vista #53***



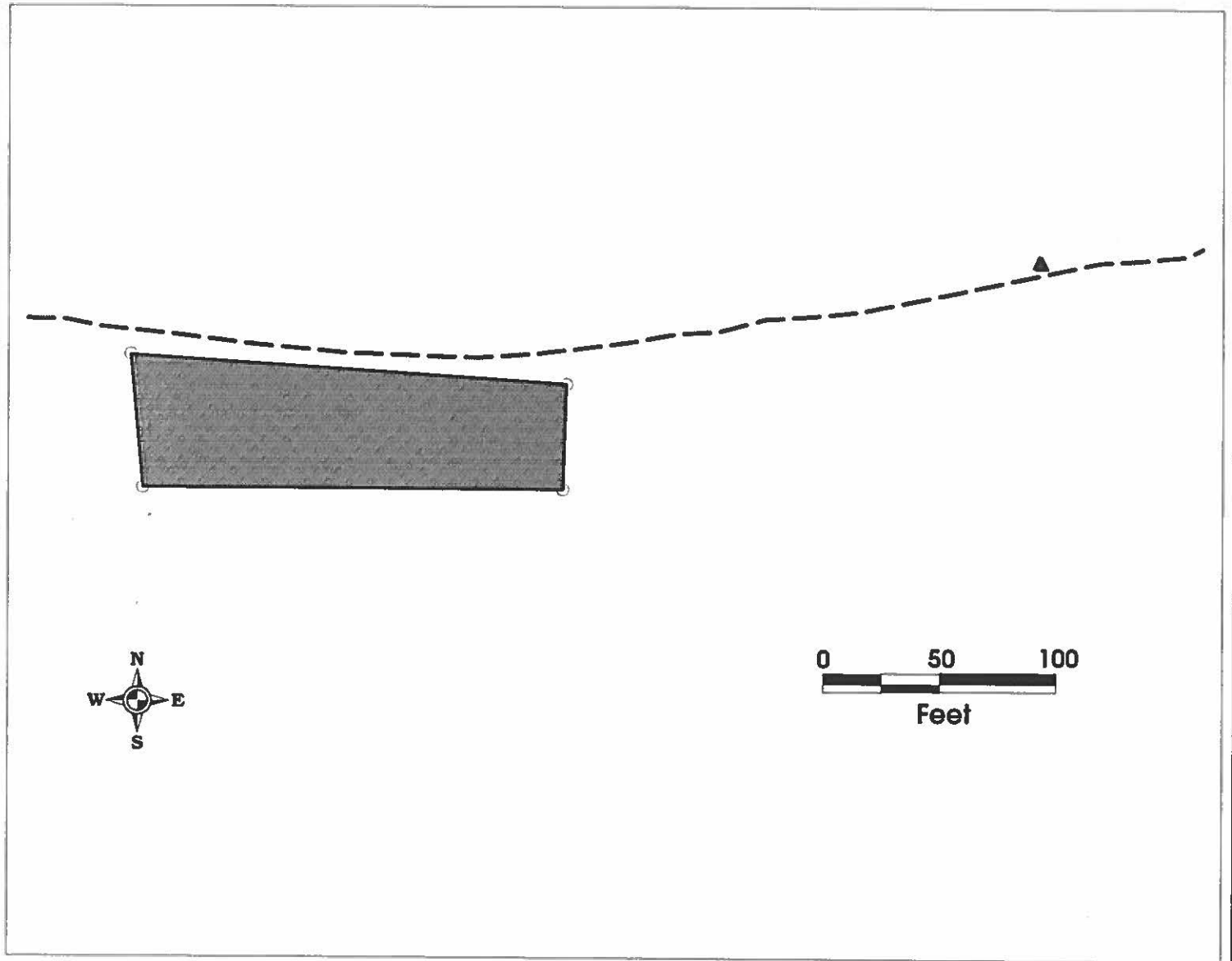
Legend

- Vistas*** - - - - - 
- Roads*** - - - - - 
- Corner Points*** - - - 
- Culverts*** - - - - - 
- Image Angles*** - - - - - 
- Bridge*** - - - - - 

Notes

***GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: N/A***

*Acadia National Park
Mount Desert Island, Maine
Carriage Road Vista #4*



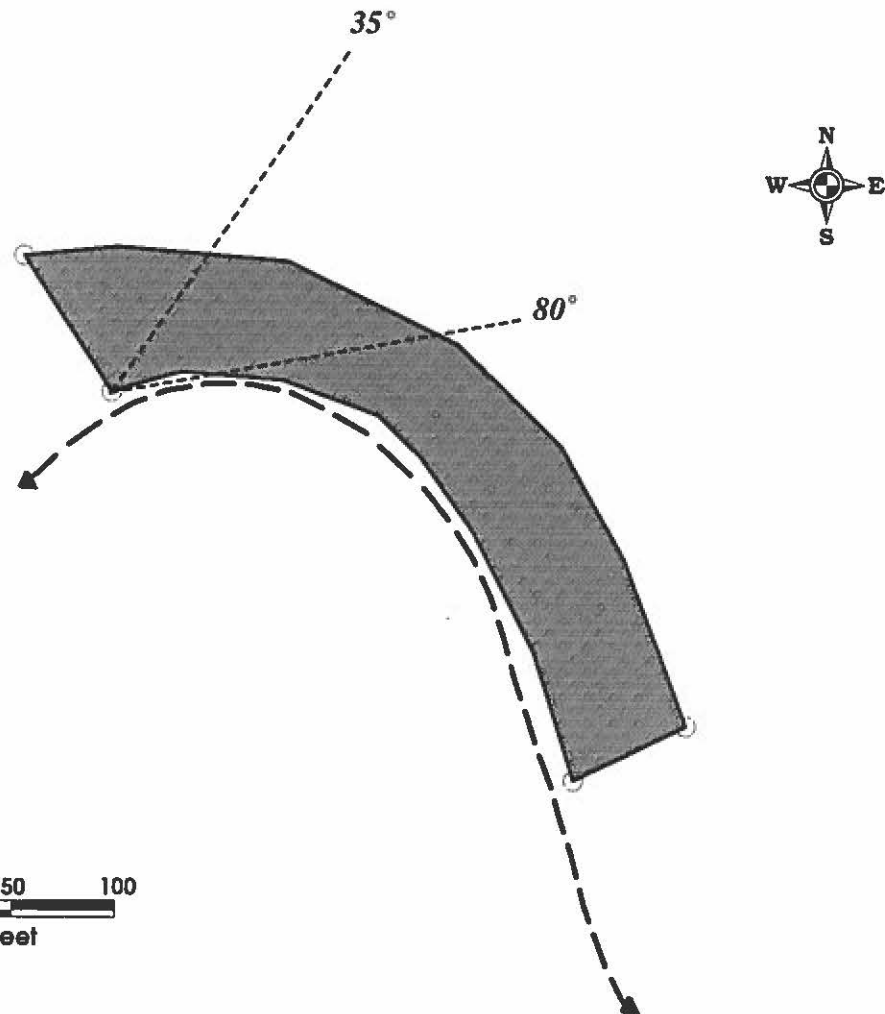
Legend

- Vistas* - - - - - 
- Roads* - - - - - 
- Corner Points* - - - 
- Culverts* - - - - - 

Notes

*GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: N/A*

***Acadia National Park
Mount Desert Island, Maine
Carriage Road Vista #8***



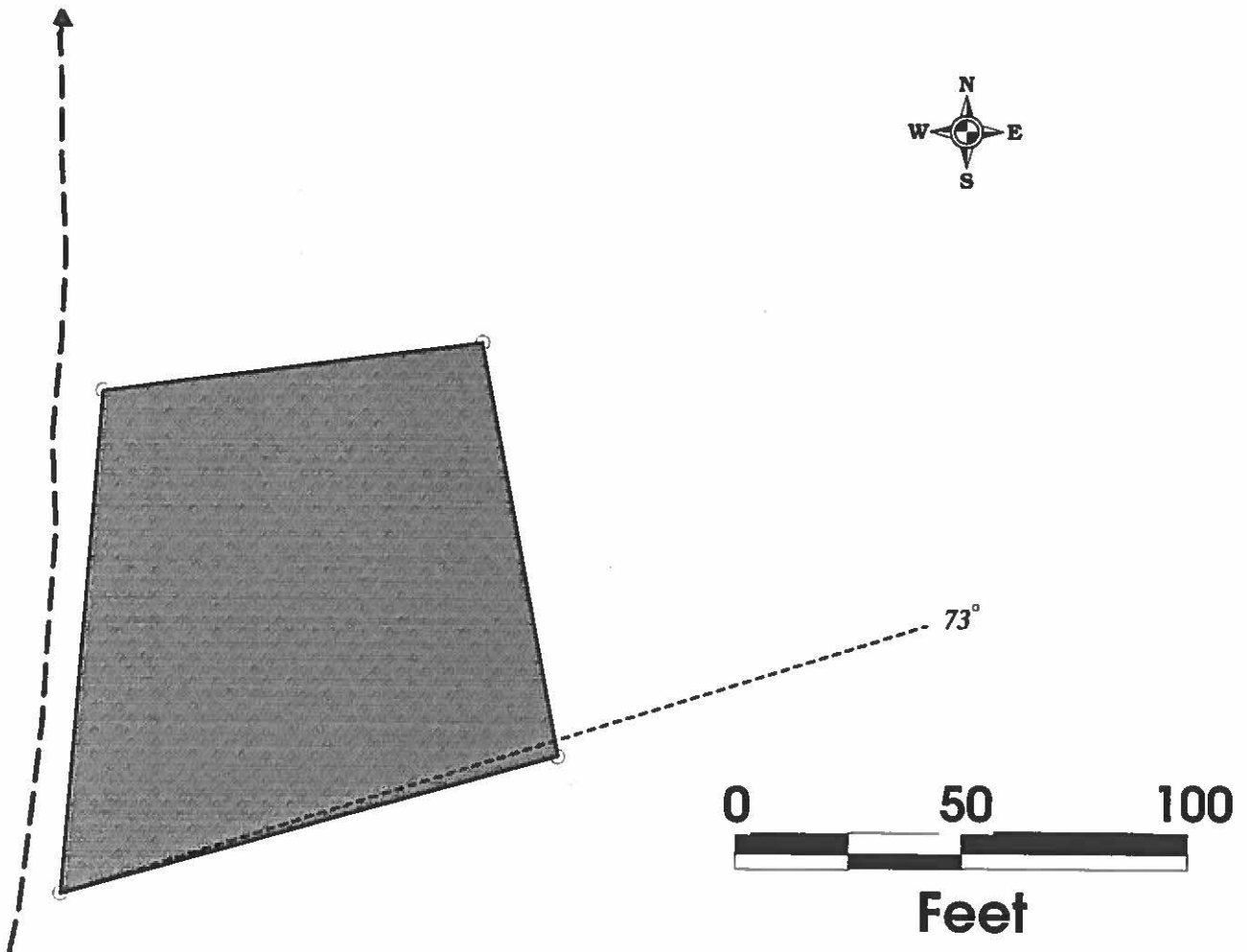
Legend

- Vistas* - - - - - 
- Roads* - - - - - 
- Corner Points* - - - 
- Culverts* - - - - - 
- Image Angles* - - - - - 

Notes

*GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: 21,22*

*Acadia National Park
Mount Desert Island, Maine
Carriage Road Vista #31*



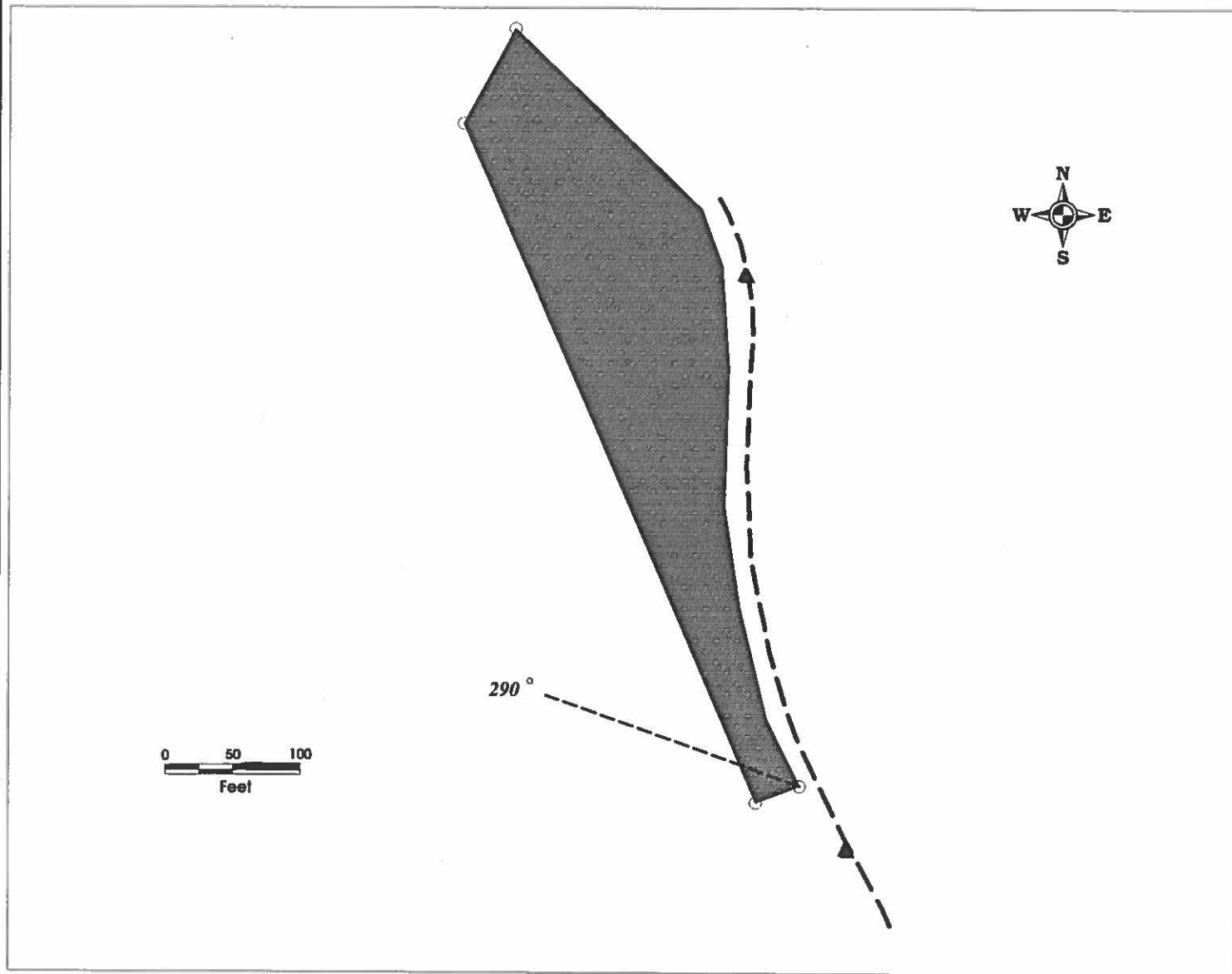
Legend

- Vistas* - - - - - 
- Roads* - - - - - 
- Corner Points* - - - 
- Culverts* - - - - - 
- Image Angles* - - - - - 

Notes

*GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: 23*

*Acadia National Park
Mount Desert Island, Maine
Carriage Road Vista #94*



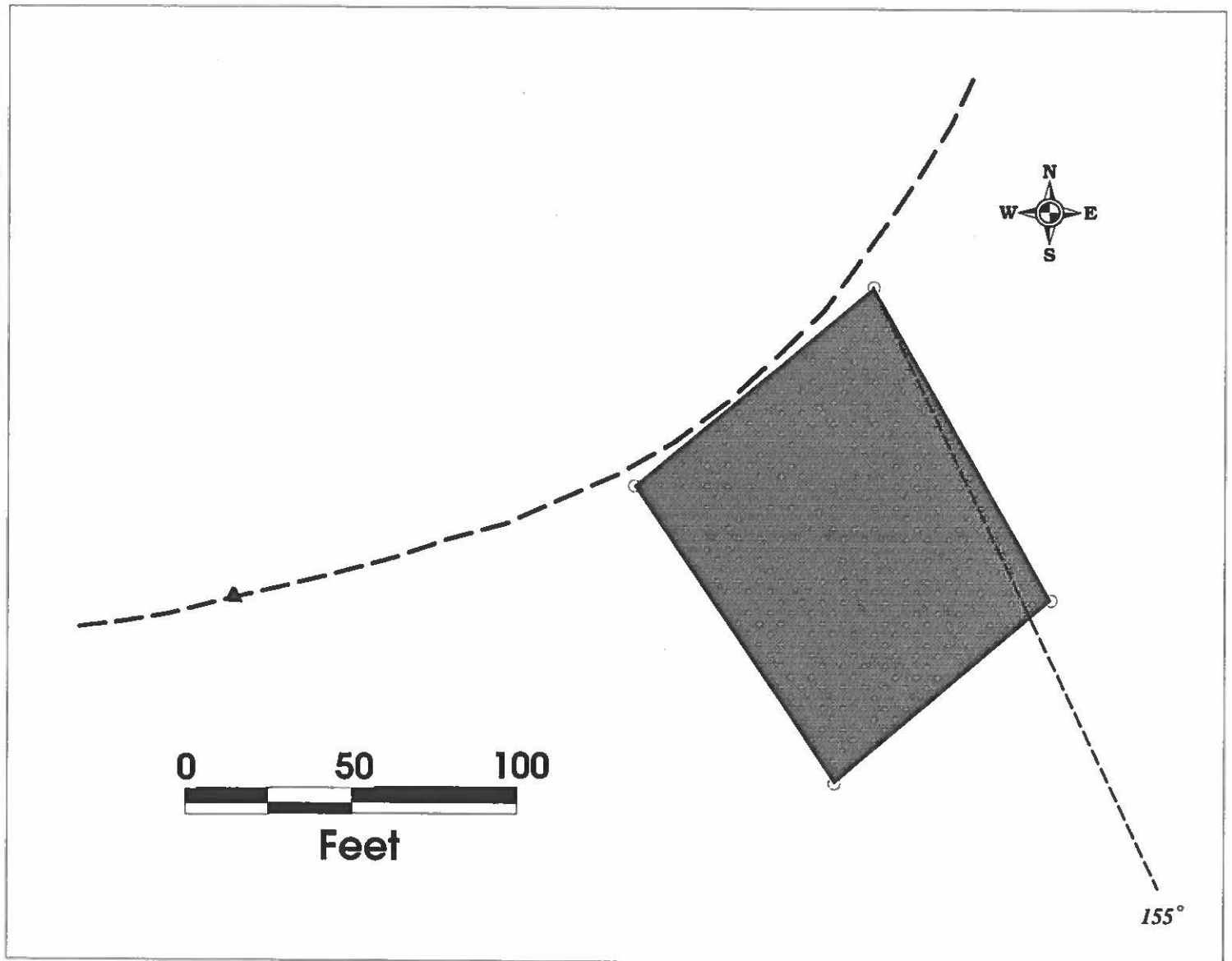
Legend

- Vistas* - - - - - 
- Roads* - - - - - 
- Corner Points* - - - 
- Culverts* - - - - - 
- Image Angles* - - - - - 

Notes

*GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: 14*

*Acadia National Park
Mount Desert Island, Maine
Carriage Road Vista #87*



Legend

- Vistas* - - - - - 
Roads - - - - - 
Corner Points - - - 
Culverts - - - - - 
Image Angles - - - - - 

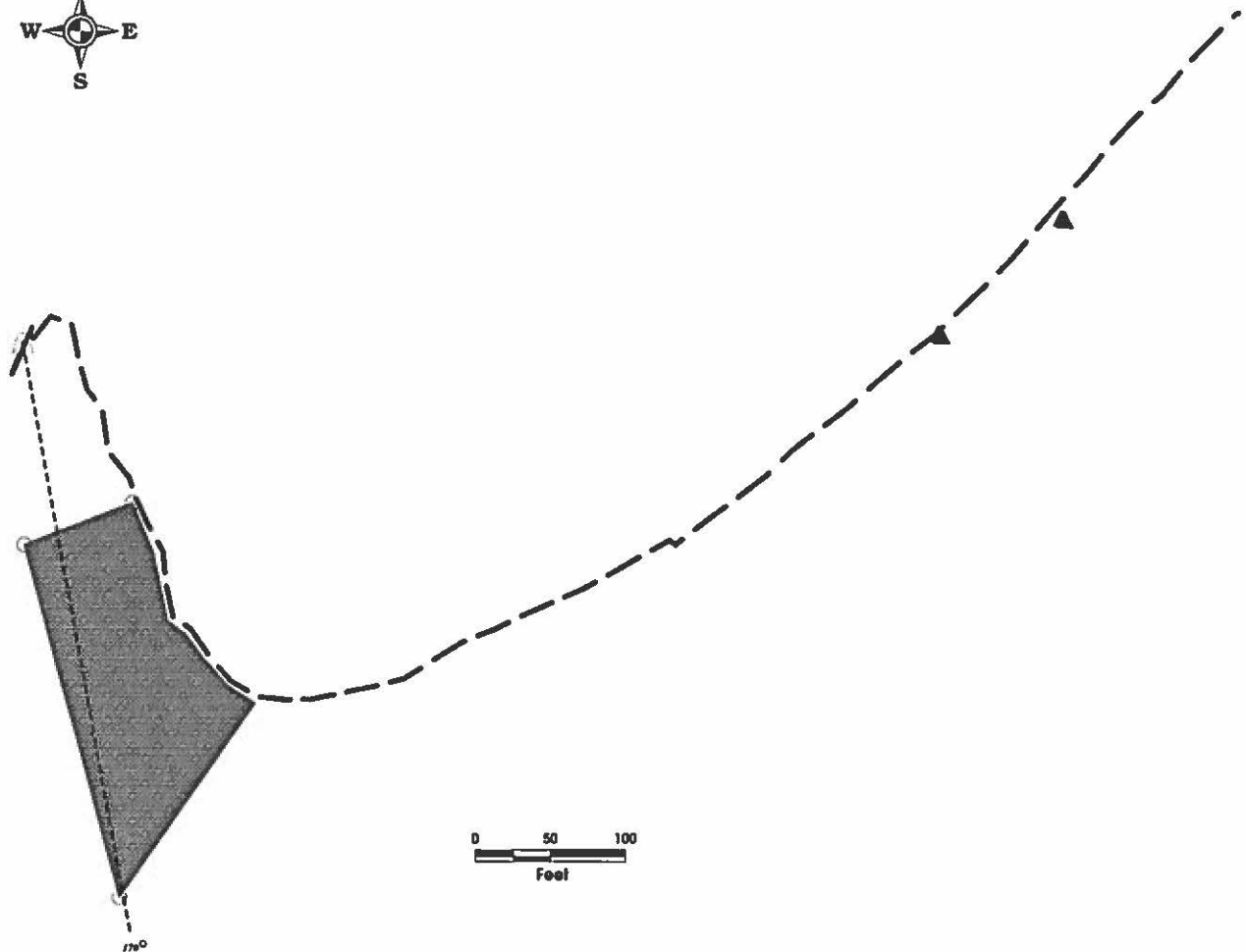
Notes

*GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: 20*

Acadia National Park

Mount Desert Island, Maine

Carriage Road Vista #148



Legend

- Vistas - - - - -
- Roads - - - - -
- Corner Points - - -
- Culverts - - - - -
- Image Angles - - - - -
- Bridge - - - - -

Notes

GPS data collected by University of
Maine Forestry Students
GIS produced by Group 2
Projection:
Universal Transverse Mercator (NAD 27)
Date: May 29, 1997
Digital Images: 28