D-B RANCH

New Mexico Adventures in
Supercomputing Challenge
Final Report
April 4, 2005

#037
Melrose High School

Team Members:

Ramon Arenivar
Call Barnard
Kevin Estes

Teachers:

Rebecca Raulie
Alan Daugherty

Project Mentor:

Alan Daugherty

TABLE OF CONTENTS:

EXECUTIVE SUMMARY

Our main purpose was to make a computer model that shows a land area (based on NM range land) that demonstrates interactions between all major living organisms present. The weather factors are based on a 20-year rain average in our local area. The model allows predictions to be made about how the living organisms respond to changes in the ecosystem. The model will be useful to farmers, ranchers, and research biologists allowing them to predict changes and plan for new production practices. The use of math equations will allow the system to be accurate and reliable to all who depend upon its efficiency. The expected results were not what we exactly expected; the project was a lot harder than what we thought on Star Logo. We hope we can continue to work on this project in our freshman year. Since it is so complex we will have to make a simpler model for this time and make a more complete model next year. So far we have learned not to be procrastinators and use our organizational skills better in the future, but for the last few weeks we have been learning teamwork that will become extremely useful as we become more familiar with the A I S Program Challenge. We would like to thank Nick Bennett for his tremendous generosity in helping us out with our math equations. We would like to also thank our mentors and schoolteachers, which allowed us to use school time to work on our project.

D-B Ranch

Our project is going to study the ecology of a ranch. The study is going to come form the research of farmers, university scientists, and also environmental studies. Many facts will also come from the actions of the weather based on our New Mexico weather environment.

The project will have many factors and variables included in the study of this ranch. To be included are different kinds of animals, plants, the weather, and also humanity. Just depending on the actions of these different varieties of groups is what makes this project work. There is many different living ways on a ranch.

Computer Model

This will help ranchers determine the correct amount of cattle that a section can support. This will also help the New Mexico Environmentalist Office also by enabling them to put a correct limit of cattle in a section. It will also help the Department of Game and Fishing to lift hunting limits on state land to accelerate the efficiency of grass uses.

To calculate this project we will use the computer program called, Star logo. We will interview some farmers and ranchers who have worked with cattle and will

know the exact ratios of cattle intake and daily grass growth. We will also figure

out the exact amount of food a coyote intakes in 1 day.

TABLES FOR D-B RANCH CREW

2 Year Old Heifers		
Lbs/ at start of feeding	Lbs. Daily gain	Min. Dry matter consumption
800	.5 lbs	17.6
900	.5 lbs	19.2
1000	.5 lbs	20.8

CONCLUSIONS:

Our first conclusion was that this was a much harder project than we had thought to begin with. The model that we are building is displaying accurate information concerning the ecology of a New Mexico ranch. The Star Logo system is very useful in displaying accurate information that can relate to many different circumstances in a Ranch's life. We can program what happens in increase of population in wildlife and what happens when it does increase. The main concerns for our project was to even out the situations happening in the ranch and have an accurate ranch ecosystem. Star Logo would have been able to keep the factors perfectly to where the rabbits would reproduce in the same amount of time that they would be killed to where the rabbits would not reach extinction in the ecosystem. Also to where the cow would not eat all of the grass before it would have had time to destroy the grass. The main thing was that this was mostly a learning experience for our team to understand the projects in Star Logo & The Challenge. Some administrative parameters on the school computers did not allow us to finish the project completely, or in a way that we had expected. Our best accomplishment in this project was having a hand on experience and finishing.

REFERENCES

Eastman Clyde Community Grazing
James R. Gray
1987

Richard D. Lee New Mexico's Invasive Weeds
1999

Eric G. Bolen Wildlife ecology and management
William L. Robinson
1999

Ecology and Management of wild grazing animals in temperate zones

United States Congress House Committee on agriculture subcommittee on livestock, dairy, & poultry
1988

Calvin Clay Boykin
1924