Saving Providence Canyon for Farming

Fact Sheet

PROVIDENCE CANYON

How to Conserve for Farming What's Left of Providence Canyon State Park

Providence Canyon State Park is in Stewart County, Georgia, about 150 miles southwest of Atlanta. It occupies the southern 60% of Georgia referred to as the Coastal Plain. The canyon itself is west of the city of Lumpkin.

History

The landscape of Providence Canyon State Park has changed greatly since the early 1800s, from a gently rolling landscape suitable for agriculture to a deeply eroded network of gorges. Once erosion started to form gullies, this had a snowball effect as it encouraged further erosion as large canyons formed. How did it get that way? Mostly through **poor farming practices** that failed to protect from the **effects of erosion**.

- Vegetative cover was cleared, promoting erosion.
- No attempt to prevent runoff
- No attempts to prevent other forms of erosion
- Fields of single crops, such as cotton
- Lack of crop rotation
- Horse-drawn plows

Soil Sustainability: occurs when the rate of new soil creation is at or greater than the rate of soil erosion. Factors influencing soil sustainability:

1. RAINFALL AND RUNOFF (EXCESS RAINWATER RUNS OVER EARTH'S SURFACE AND CAUSES EROSION)
2. SOIL STRUCTURE AND TEXTURE
3. LENGTH AND STEEPNESS OF LANDSCAPE SLOPES
4. COVER MANAGEMENT (PROTECT TOPSOIL WITH PLANTS OR STRAW)
5. AGRICULTURAL PRACTICES (TILLING AND SINGLE CROP FIELDS ENCOURAGE EROSION)

Soils of Providence Canyon Park

The Park contains 43 types of soils, ranging from course sand to heavy clay, with structure ranging from loose and incoherent to impervious and plastic. Many of the soils were deposited by streams, and the land has numerous interconnected streams that contribute to erosion. Sandy loam soils are also included and were useful for farming cotton. The canyon itself is composed of loosely arranged sand and clay particles (sediments) carried by running water. The sediments are mostly sand, silt, and clay and come in different colors: white, pink, purple, red, brown, yellow, and black.

Two Major Erosional Processes

1) **Surface Water Runoff** – Rainfall flowed unimpeded across the land, carrying topsoil and widening gullies. Because the canyon is made of loose sediments, heavy rain can remove as much as six feet of canyon floor in one night.

2) **Erosion from groundwater** (water under the ground) – Rain soaks into the ground and into the pores between sand grains and keeps moving down until it hits an impermeable layer that won't let the water pass. At this point, the water moves sideways and weakens the canyon walls. This can cause sediments to come crashing down, widening the canyon.

Soil Organic Matter: Part of the soil composed of anything that once lived

INCREASE SOIL ORGANIC MATTER TO INCREASE SOIL FERTILITY AND RESISTANCE TO EROSION!

Providence Canyon

By Lynne Schultz

The Effects of Climate Change

Over time (about 2080-2099), southern Georgia is likely to experience a 5-10% drop in precipitation during each summer growing season, according to NOAA NCDC/Cooperative Institute for Climate and Satellites and a simulation of 15 climate models. Climate change in general is likely to bring drought, crop yield decreases, higher temperatures, and a higher risk of fire.

Although less rain does mean less erosion through the effects of rain water, this will not be enough to reverse the path of further erosion of Providence Canyon. Furthermore, if high temperatures and dry conditions due to climate change lead to fires, that can actually cause further erosion through the destruction of plant life and ground cover.

Call to Action

Continuing the practices of the past will lead to further erosion and creation of more canyons, guaranteeing that none of the land will be suitable for agriculture.

Soil sustainability, making sure the rate of soil erosion is no greater than the rate of new soil creation, is the key to this goal.

Using agricultural practices with soil sustainability in mind will give you soil that is more fertile, allow you to increase your crop yields, and protect the land for future use.

Recommendations

- Increase soil organic matter (soil composed of once living material) by
  - Rotating crops with pasture or perennials (alfalfa, clover, grass)
  - Leaving crop residues on the field
  - Or adding organic material, such as manure, litter or sewage sludge
- Plant more trees so that their leaves catch falling rain to prevent erosion.
- Use surface cover, such as mulch, straw or plant cover to prevent erosion.
- Avoid plowing or tilling if possible. If you must plow or till, vary the depth.
- Avoid single crop fields. Use these alternatives instead:
  - Rotate crops
  - Strip cropping (alternate crops in rows)
  - Contouring (rows of crops in hillsides)
  - Terracing
- Stay off wet soils when soil water is 3-6 inches deep
- Restrict wheel traffic

Feasibility Issues

1) **To till or not to till…** Untilled soil has been shown to be healthier soil with better structure. However, if you must till, varying the tilling depth is another alternative to help fight erosion.

2) **Strip cropping (rows of alternating crops)…** Part of the reason for the erosion of Providence Canyon is the use of large fields for farming a single crop. Alternating rows of different crops is a good way to prevent erosion. You will need to be aware of which crops will be compatible with each other, but research has been done and it is not an insurmountable problem.

Sources:
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Soil Survey of Stewart County, GA (David D. Long, M.W. Beck, E.C. Hall, and W.W. Burdette, 1913)
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