Fairhope Gullies-
Appreciating and Protecting These Unique and Important Features of Fairhope and the Eastern Shore

This photograph (courtesy of the Fairhope Museum of History) was taken by Frank Stewart, "the Picture Man," an important visual historian of the Eastern Shore community. It shows that even before the introduction of invasive plant species in the early 20th century gullies already served to convey stormwater from city streets to the Bay.

What is a "gully," and why are there gullies in Fairhope?

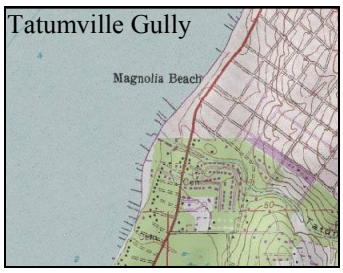
Gullies are small valleys or ravines, originally formed by running water, that serve as drainage ways after heavy rainfall. Gullies existed in Fairhope and along the Eastern Shore long before the end of the nineteenth century, when the "Single Tax Colonists" settled on the high bluffs overlooking Mobile Bay. These bluffs, some over 100 feet high, are located on the eastern side of a geological *graben* (meaning "ditch" in German) that underlies Mobile Bay and the Mobile-Tensaw Delta. The bluffs formed from the settling of water-borne sediments millions of years ago when our present coast was covered by hundreds of feet of water. Our gullies result from the combination of our rolling landscape, erodible soils, and the extraordinary amount of precipitation that falls on our region. Over its steep path towards receiving waters like Mobile Bay or Fish River, runoff from rain events has cut deep ravines, or gullies, into the landscape from Fairhope north to Spanish Fort and even beyond.

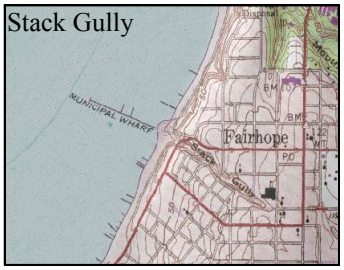
In 1894, "Single Taxers" found a Fairhope with several deep gullies carved into a landscape largely denuded of trees. Extensive clear cutting in the late 19th century left much of Baldwin County subject to horrific washouts from the frequent heavy rains.

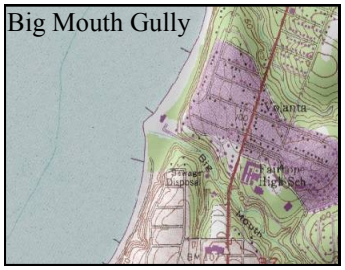
In another photograph by Frank Stewart (courtesy of the Fairhope Museum of History), students from the School of Organic Education gather for archery classes. Gullies provided an exciting venue for exploration, nature study, and geology lessons.

The Colony's purchase and set-aside of gully areas for re-growth and later permanent protection represents one of the oldest such corporate-public partnerships in the country. Over time it has created nearly 100 acres of beautiful and effective watershed management areas, priceless legacies of these visionary settlers.

Many Fairhope residents live on or near gullies, like Tatumville, Stack, Big Mouth, Volanta, or unnamed ravines or gullies at the headwaters of Fly and Rock Creeks. Most are on the western side of the natural "divide" at Greeno Road (Highway 98) and carry stormwater down a steep gradient to Mobile Bay. Stormwater falling on the east side of this divide flows more gradually towards Fish River (see map of watersheds on the following page).







What purposes do gullies serve?

The scenic gullies have long been used by Fairhope residents for recreation. They were a field trip destination for students of Marietta Pierce Johnson's School of Organic Education in the early 1900s. The School used their sandstone walls as outdoor chalk boards, clay banks as a source of pottery material, and the gully flora as background for theatrical productions. Gullies have long provided a place for kids of all ages to climb and explore amidst the quiet of rustling trees and seeps splashing from exposed walls.

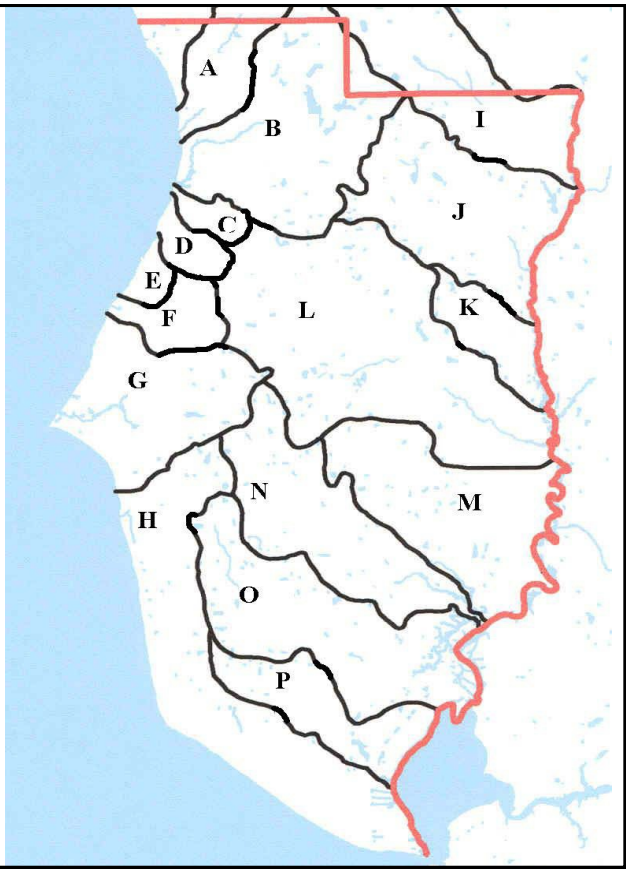
Exposed layers of red and gray clay have been exploited by potters for thousands of years. Indian communities mined the clays and used them for earthenware pottery long before the descendants of Europeans arrived. Old ground hog and beehive pottery kilns built by settlers and still scattered along the bluffs remain from an industry that boomed late in the nineteenth century.

The most important role of gullies - increasingly so as our natural landscapes are "hardened" by development - is conveyance of stormwater from city land surfaces to the Bay. When the park lands, public beach, and wharf were deeded to the Town by the Single Tax Corporation in the 1930s, it was conditional that the gullies remain "as drainage ways

Watersheds of the Fairhope Planning Jurisdiction

A. Rock Creek
B. Devil's Hole/Fly Creek
C. Unnamed Volanta Area Gully
D. Big Mouth Gully
E. Stack Gully
F. Tatumville Gully
G. Point Clear Creek
H. Bailey Creek/Caldwell Swamp/ Gum Swamp
I. Caney, Picard, and Rockhead Branches
J. Pensacola and Worm Branches
K. Still Branch
L. Cowpen Creek
M. Green and Louis Branches
N. Waterhole Branch
O. Lower Turkey Branch
P. Weeks Branch

From the Audubon International's **Natural Resource Inventory for the City of Fairhope**



The figure at left shows watersheds located within the Fairhope Planning Jurisdiction. Gullies represent the receiving waters within several of these watersheds and are components of several others.

for water from streets and other public and private lands." Municipal storm drains channel runoff from city streets through drainage pipes that empty into the gullies. The frequently porous, sandy gully bottoms allow water to infiltrate and recharge the vital ground water supply which provides drinking water for Baldwin County residents. Stormwater that is not absorbed flows down through the gullies and into the Bay. Whether residents live on the edge of a gully, in the "Fruit and Nut" section, or elsewhere in Fairhope, they depend on the gullies to channel heavy stormwater away from their homes and businesses.

Threats To Gullies

Among the problems threatening these natural channels are **erosion**, **debris**, and **invasive species.**

Erosion The bluffs that were settled by the Single Tax Colonists are products of thousands of years of natural erosion. Steep bluff faces, exposed by water cutting through the soils of the Eastern Shore, reveal what Mobile Press-Register writer Bill Finch described as "the layer cake profiles of Baldwin County soils and sediments." He explained that the base is a thick, hard, nearly impermeable layer of blue clay, deposited tens of millions of years ago as a graveyard for ancient marine life. Higher, younger, and shallower layers have been shaped by the action of rivers, seas, wind, and general geological upheaval. They are "a hodgepodge of alternating seams of white sands, reddish gravels, orange clays, gray silts, and any combination thereof," according to Geological Survey of Alabama geologist Richard Hummell. The same kinds of erosion that created the gullies – **sheet erosion, rill erosion, and slumping** – continue to change their landscape today.

Sheet erosion is the removal of layers of surface soil by the force of falling raindrops and overland flow of stormwater runoff. Mulching or planting vegetation or sod are ways to prevent raindrops from dislodging soil particles to be transported by "sheet flow" of runoff. Diversion structures can be used to slow runoff flow over a bare slope, and terracing (see below) can be used to reduce the effective slope length of the surface to break up sheet flows. Sheet

Terracing can be used to reduce effective slope length of gully walls. Photo: City of Fairhope

erosion is uniform, gradual, and difficult to detect until it develops into rill erosion.

Gullies are formed from ***rill erosion***, which occurs as runoff begins to form distinct channels. When rill erosion begins, erosion rates increase dramatically due to the resulting increased volume of water and speed at which it flows. Rilling can be remedied by tilling or disking; otherwise rills concentrate to form larger channels which can progress to gully formation. Both sheet and rill erosion are caused by forces of water acting on the surface.

Slumping events leave roots and bare gully walls exposed.
Photo: City of Fairhope

The fastest, most dramatic, and most destructive type of erosion that threatens bluffs or gullies is ***slumping***. As water from rain seeps into the subsurface, it percolates through layers of sand until it is halted by an impermeable layer of clay. With enough water from a particularly heavy rainfall, sand overlying that layer becomes saturated, and that's when problems begin! The water has a lubricating effect on the sand grains that gives the whole mixture a fluid character, like quicksand. The force of gravity and the weight of overlying layers squeeze seams of "fluidized" sand towards bluff openings, where normally one would find spouts, seeps, or springs. Tons of this slush are forced out to the toe of the bluff or bottom of the gully, "pulling the rug" from under overlying layers. Left with nothing to support them, bluff or gully walls can suffer "global failure" and huge wedges of earth tumble down, leaving massive, bare, arc-shaped scars. The yards and homes of residents living along gullies are particularly vulnerable to these events. In 1916, two kindergarten students were killed by a collapsing gully wall.

Debris Problems associated with debris in gullies are caused by human activities. Gullies have long provided places for the convenient, if irresponsible, disposal of appliances and other trash. Yard waste, including grass clippings and discarded

Debris left on sandy gully bottom by illegal dumpers.
Photo: City of Fairhope

branches and tree limbs, also commonly finds its way into Fairhope gullies. As recently as 1993, a gully near Equality Avenue was used as a dump by the State Department of Transportation with the City's permission. Besides ruining the view, debris blocks conveyance of stormwater, potentially worsening problems with erosion and flooding and creating ideal breeding conditions for mosquitoes.

Invasive Species Local nurseryman and plant expert Bobby Green estimates that 90% of the plants found in the Fairhope gullies are non-native, invasive species. Some have been intentionally planted to stabilize gully walls, but most are "escapees" from gardens. Their mobility is related to their capacity to produce tremendous numbers of seeds with high germination rates that can be carried along by runoff. Invasive species degrade native habitats by outcompeting indigenous flora favored by native animal species.

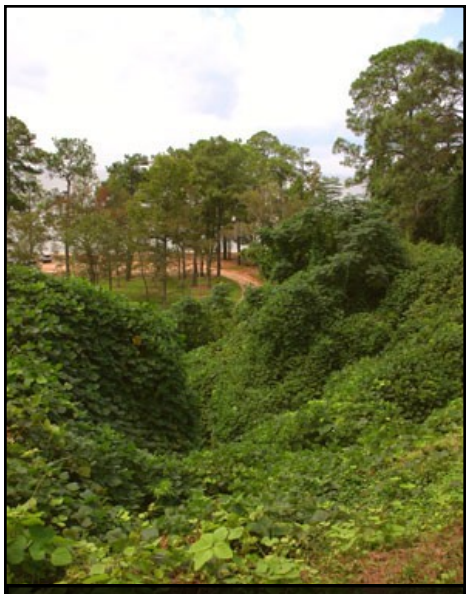


Photo: www.fairhopesingletax.com

We can speculate that plant life in the gullies was once sparse, probably consisting of longleaf pines gaining footholds in self-terracing, aging bluffs. Native grapes probably formed a loose web over the clay-sand soils. Smaller trees and shrubs that competed with the grapes would be red cedars and beauty berry (*Callicarpa sp.*).

Asian species were introduced in mass over the last 150 years and many found our climate most hospitable. Ligustrum, privets, Chinese tallow, camphor trees, bamboo, kudzu, Japanese climbing fern, and honeysuckle are all conspicuous invaders of the Fairhope gully system. In fact, many are so successful that the once sparsely vegetated gullies are now dense, rain-forest-like environments. Kudzu (see below), perhaps the "poster child" for southern invasive plants, has no significant predators and will completely overwhelm large areas, destroying all native vegetation, including large trees.


Photo: www.fairhopesingletax.com

Any plan to replace this tangled mess of invasives should be carried out with great care and proceed in small doses rather than denuding entire bluffs. ***What might we use to replace exotic invasives as the dominant flora of our gullies?*** **Bobby Green makes the following recommendations:**

Clump-forming Bamboo (mostly genus *Bambusa*) include some well behaved, clump-forming giant grasses with dense root systems that can become established in poor soils.

***Aspidistra* (cast iron plant)**, a clump forming plant with soft, upright, sword-shaped leaves can cover an extensive area and lends itself to transplanting by division. It has long been used atop gullies to slow the sheet erosion.

***Ternstroemia* (false *Cleyera*)** are evergreen shrubs or trees related to camellias that have naturalized to some degree in our gullies. Their dense canopy seems to offer some erosion protection from heavy rains. Their habit of colonizing without invasive spreading makes them a good choice for a 10-20-foot plant.

***Ophiopogon* (mondo or monkey grass)** forms a thick carpet above the gully and can be used along with the *Aspidistra* as ground cover.

***Juniperus virginiana* (red cedar)** is a good candidate for planting on natural terraces within the slopes.

***Pinus* sp. (longleaf, slash, and spruce pine)** are still scattered within our gullies and could be used more often. Bobby recommends planting them at the base or within the lower 25% of the slope.

Recommendations

If the scenic gullies that distinguish Fairhope and carry stormwater runoff from its streets and properties are to be preserved the City and its residents will have to manage and protect them. While invasive plants currently protect gully walls from the same forces that created them, they also outcompete native plants that provide vital ecological services to native wildlife. Replacing invasive vegetation with native plants is a good course of action, but it will require thoughtful planning and gradual implementation.

The problem of erosion will have to so be addressed "uphill", at the source of runoff. The City and its residents should work to reduce the amount of impervious surfaces, like pavement, that prevents our abundant rainwater from infiltrating into the ground. Effective individual stormwater management practices like rain gardens, infiltration swales, and pervious paving must be accepted and increasingly used, not only to preserve the gullies but to maintain the quality of coastal waters.

Litter, yard waste, appliances, and other trash that get into our gullies ruin the view, block stormwater conveyance, promote mosquito breeding, and create health concerns. Residents should prevent not only large, physical debris from entering the gullies but also less obvious "non-point source pollutants" like fertilizer, pesticide, sediments, oil, grease, toxic chemicals, and pet waste, which are carried along with stormwater runoff. Our coastal waters are the economic and ecological engines that drive much of the State's economy, and groundwater is the source of drinking water for Baldwin County residents. Taking care of our gullies is taking care of our water, both on the surface and in the ground.

Reclaimed and stabilized gully located behind Green's Nursery on Greeno Road with Ternstroemia, pines, and oaks replacing invasive species.

This document was prepared by the Mobile Bay National Estuary Program and the Fairhope Environmental Advisory Board in partnership with the Fairhope Single Tax Corporation, who generously paid for its printing. The MBNEP exists to provide necessary tools and support community-based efforts to promote the wise stewardship of the water quality and living resources of Mobile Bay, the Delta, and the coastal waters of Alabama.