Meeting Date
10/04/2016

AGENDA	
Section	New Business
Item No.	VI.F.1

AGENDA REPORT

BREVARD COUNTY BOARD OF COUNTY COMMISSIONERS

SUBJECT:	114 Acres of Surplus land in Suntree
DEPT/OFFICE:	Citizen Request: Tom and Anita Unrath

Requested Action:

To approve a conservation easement on the 114 acres, renaming it Hundred Acre Hollows. To approve our vision for the land of "maintaining the wildlife on-site, enhancing quality of life for people of all ages with STEM education, and initiate a partnership among the public, private, and nonprofit sectors." To allow GREAT! to form a nonprofit to seek funding for maintenance, education, and outdoor classrooms.

Summary Explanation & Background:

On July 7, 2015, many residents urged the Commission not to sell the 114 acres for 200 houses. The property is land-locked except for a green lot between two houses in the middle of a 22 ft. wide cul-de-sac that has 58 houses. The Commission voted not to accept the bid and agreed to allow us to find the "highest and best use" of the property.

We organized a grass-roots citizen group and named ourselves GREAT! (Green Space Environmental Advocates Task Force). We met monthly to discuss our progress and reported to Commissioner Smith. In Sept 2015 we asked him for six months to study possibilities for the property.

We asked for permission for four teachers from four county high schools called the "Space Coast Eco Geeks" to use camera traps to photograph the animals on the property. They have thousands of photos of the gopher tortoises and other animals that live on the property. They GPS tagged 249 gopher tortoise burrows, but there are likely more that are hidden under the Brazilian Pepper trees that have grown over the embankments.

In January 2016, we met with gopher tortoise experts at FWC in Tallahassee and walked the property with a FWC gopher tortoise expert. In March 2016, we reported to Commissioner Smith with a power point presentation of photographs. He advised us to meet with the other four commissioners which we did in April 2016. We said we would report back to the Board of Commissioners at a public meeting in the fall with a plan of action.

Tom and Anita Unrath
tunrath@cfl.rr.com
757-3637

Clerk to the Board Instructions:

Exhibits Attached:

Contract /Agreement (If attached): Reviewed by County Attorney	Yes ☐	No ☐	PR ☐

County Manager	Assistant County Manager, Frank Abbate	Department Director / Extension
Stockton Whitten	Assistant County Manager, Venetta Valdengo	

BREVARD County
BOARD OF COUNTY COMMISSIONERS

FLORIDA'S SPACE COAST

Tammy Rowe, Clerk to the Board, 400 South Street • P.O. Box 999, Titusville, Florida 32781-0999

Telephone: (321) 637-2001
Fax: (321) 264-6972
Tammy.Rowe@brevardclerk.us

October 5, 2016

M E M O R A N D U M

TO: Stockton Whitten, County Manager

RE: Item VI.F.1., Citizen Request from Tom and Anita Unrath Regarding 114 Acres of Surplus Land in Suntree

The Board of County Commissioners, in regular session on October 4, 2016, tabled consideration of Citizen Request from Tom and Anita Unrath regarding 114 acres of surplus land in Suntree, to the October 18, 2016, Board meeting.

Your continued cooperation is greatly appreciated.

Sincerely,

BOARD OF COUNTY COMMISSIONERS
SCOTT ELLIS, CLERK

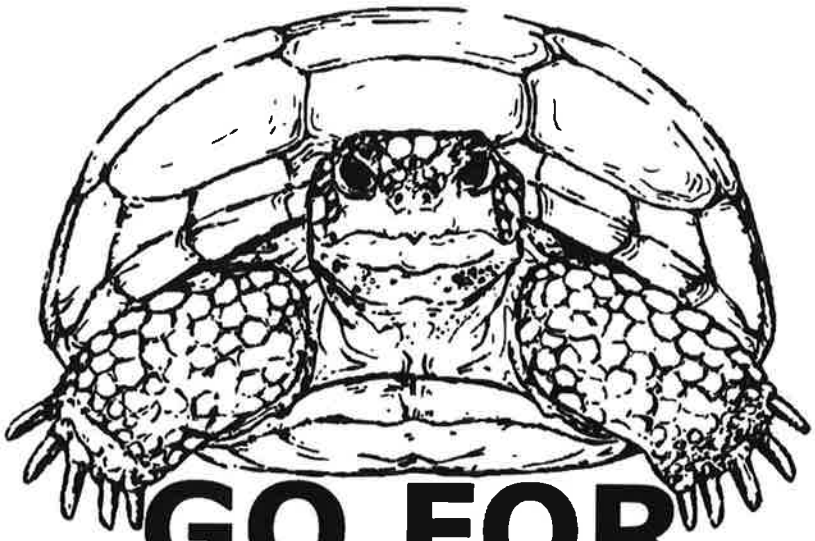
Tammy Rowe

Tammy Rowe, Deputy Clerk

"Hundred Acre Hollows"

Brevard Wildlife and STEM Education Center

To discover, study, and teach about Florida's plants and animals to help sustain and enrich lives.



GO FOR SUSTAINABILITY

Prepared by:

GREAT! Green Space Environmental Advocates Task Force

Table of Contents of the GREAT! Report

114 Acre Brevard County Board Report

Project Summary

GREAT! (Green Space Environmental Advocates Task Force) is a grass-roots group of concerned citizens working on the highest and best use of the 114 acres due west of our properties. We formed the group last August after the Brevard County Commissioners voted not to sell the property for a housing development at their July 7, 2015 meeting. In addition to the Springs of Suntree, people from Devon's Glen and Mandarin Lakes on the south of the property and many others from Viera and Suntree including Capron Ridge, Grand Isle, Viera East, and Baytree are in the group. We also have people interested from Cocoa to Indian Harbor Beach. This truly is a widespread group.

We are working for and reporting to District 4 Commissioner, Curt Smith. Last September, we asked him for 6 months to study the property and come up with ideas for its use. We compiled a report for him in March 2016. In April, we met individually with Commissioners Fisher, Anderson, and Barfield. We met with the staff of Commissioner Infantini who then shared our briefing with her. Ultimately, all five County Commissioners will decide what will happen with the 114 acres. We are thankful that we have been given the opportunity for input.

Members of **GREAT!** networked with many experts all over Florida including Florida Fish and Wildlife Commission, various universities, schools, environmentalists, and solar experts to work towards making a place that can be used for environmental sustainability, education, institutional research, historical preservation, and community engagement.

Our goals include keeping the 114 acres as a green space and keeping the wildlife on-site for preservation and educational purposes with a STEM (Science, Technology, Engineering, and Math) center. Our vision includes both community engagement and institutional research opportunities to improve public health, sustainability, and preservation of Florida's wildlife and native plants. Also because of the historical significance of this land, it could be used for social studies education.

Four Brevard Public School Biology teachers, the Space Coast Eco Geeks, studied the threatened gopher tortoises which are a keystone species. Gopher tortoises are an ecologically important species because they dig burrows which other animals also use for homes. The teachers used GPS to tag 249 gopher tortoise burrows! Their research showed that many different animals live on the 114 acres including deer, bobcats, raccoons, possums, coyotes, armadillos, mice, rabbits, squirrels, Eastern spotted skunks, and many different birds and waterfowl.

The 114 acres is also home to many native plant species of Florida which in their own way are ecologically important. The wild grasses and prickly pear cacti are food for the gopher tortoises. The deer graze on the open fields.

A visit to the Cocoa Historical Society uncovered an 1844 land management survey that shows the historic Hernandez Trail going right through the 114 acres. The road was used for many years while settlers moved into Florida.

By preserving the 114 acres as an educational nature center, we will work with the local community organizations such as the Boy Scouts, garden clubs, and environmental groups to make this a place that brings the community together. It will benefit the mental and physical health of the people of Brevard.

There will need to be some income-generating source for the upkeep of the property. We have begun the process of looking into federal and state environmental grants, and we have talked to solar power experts about making the space energy self-sustainable. This land might also be able to be used as a site for a cell tower without negatively impacting the local ecosystem. We are planning to form a non-profit so we can apply for grants.

What we need from the Commission

1. We need the Commission to approve our vision for the land.

   Maintain the wildlife on-site to sustain Florida's wildlife corridors and to preserve its ecotourism industry.
   Enhance quality of life for people of all ages in an open, natural environment. Students of all levels engage in **STEM** (Science, Technology, Engineering, and Math) related activities in a non-traditional, outdoor setting to inspire future scientists, engineers, and well-rounded citizens. Create a hub where people can connect with one another to promote civic engagement. Have various land uses and opportunities, including passive recreation, for health and well-being.
   Initiate a partnership among the public, private, and nonprofit sectors: The County maintains ownership of the land, and the community partners with the County to maintain, operate, and provide required funding sources.

2. We need the Commission to approve a conservation easement on the 114 acres.
3. We ask for your support of the name "Hundred Acre Hollows: Brevard Wildlife and STEM Education Center."
4. We ask the Commission to allow us to form a nonprofit called "Friends of Hundred Acre Hollows." We propose a Board of Directors for this volunteer organization of 5 to 7 members who will be chosen from around the county. We also ask for:
   a. Where to place "Hundred Acre Hollows" under the county umbrella.
   b. Allowing researchers (scientists, teachers, professors, engineers, and environmentalists) on-site to figure out the best way to proceed.
   c. Permission to secure the site with locks on the existing gates.
   d. Support and green light to begin fundraising and seeking other sources of income.
   e. Guidance in how much the current upkeep of the property will cost.

Environmental Sustainability

Environmentally Endangered Land Plans

Brevard County has made the EEL management plans which are designed to preserve Florida's natural plants and wildlife. Our GREAT! Goals are very similar to the EEL goals. The goals include trying to rehabilitate disturbed lands and save the animals that live there!

A. Goals
The Sanctuary Management Manual of the EEL Program provides the following management goals for all the Sanctuaries within the EEL Program.
- Conservation of ecosystem function
- Conservation of natural (native) communities
- Conservation of species (including endemic, rare, threatened and endangered species)
- Restoration of wetlands, wetland/upland ecotones and natural hydroperiod.
- Restoration of altered or disturbed uplands, including those altered by fire exclusion or suppression.
- Collection of data to refine and improve management
- Documentation of significant archeological and historic sites
- General upkeep and security of the property
- Documentation of historic public use
- Opportunities for multiple uses and compatibility
- Provision of public access and responsible public use
- Provision of environmental education programs
- Assessment of carrying capacity of natural resources with public use

http://www.brevardcounty.us/EELProgram/ManagementPlans/

Clearly, preserving the 114 acres will serve to meet the environmental sustainability goals already set in place by Brevard County Natural Resources.

Loss of Wildlife Corridor

The corner of Viera Blvd and Holiday Springs Rd is one mile from the 114 acres. The new buildings at that intersection, as well as clearing of the pine trees further east at the north side of Viera Blvd for 90 houses, have drastically reduced the wildlife corridor for the bobcats, coyotes, and deer. We used to see deer crossing Holiday Springs. The many threatened Scrub Jays that lived on either side of north Holiday Springs Rd. are gone. On a sunny Sat in Feb. 2009, there were 22 Scrub Jays visible and counted. The birds were banded on their legs, so they were easily identified as different birds. Some Scrub Jays were relocated by the Brevard Zoo conservation department before the land was developed for buildings.

The mere thought of the loss of the 114 acres as habitat for gopher tortoises, bobcats, deer, and many other animals and birds that live there, is terrible.

Fauna of the 114 acres

Gopher Tortoises (threatened)

Many gopher tortoises (Gopherus polyphemus) inhabit the site. The Florida Fish and Wildlife Conservation Commission determined the status of the gopher tortoise as **Threatened** in September 2007. The Space Coast Eco Geeks, four Brevard County teachers from Cocoa High, Edgewood JR/SR High, West Shore JR/SR High and Bayside High studied the gopher tortoise burrows from Sept. 2015 to June 2016. They put five camera traps in several different locations on the 114 acres. They have thousands of photographs of the tortoises and many other animals and birds on the 114 acres. They tagged the burrows with GPS, and as of March 2016, there were 249 active gopher tortoise burrows located on the upper portion of the sides of the embankments located on the property. Gopher tortoises need dry, sandy soil for their burrows which can go 10 feet underground. The tortoises do not burrow on the bottom of the basins which are sometimes wet and where the water table in July 2015 was 25 inches below the south west basin.

Deer

A family of 4 deer has been photographed together several times in 2015. In Jan 2016, a wildlife camera showed two pregnant does. There was fresh deer scat at the entrance to the land on the berm to the north of Devon's Glen on Sept 5, 2016.

Bobcats

Both male and female adult bobcats have been reported, and a female cub was killed on Holiday Springs Rd in March 2015. Bobcats have been recently seen in the 114 acres from Mandarin Lakes as well as in the yards of residents in Suntree Woods, Devon's Glen, Indian River Colony Club, and the Springs of Suntree. In Nov, 2015, a bobcat was photographed in the back yard of a home on Rock Springs Rd which is adjacent to the property. On Feb 1, 2016, a lady who lives on Juno St. in the Springs of Suntree reported a mother bobcat with two babies in her yard. On Sun. Sept 18, 2016, two bobcats were seen walking across Forest Leaf Rd. south of Spyglass Hill Rd. in Suntree at 10:45 a.m.

Coyote

A coyote was photographed on the land. Coyotes eat tortoise eggs and baby gopher tortoises. A coyote may have killed and eaten a Magnolia Springs house cat in Feb. 2016.

Raccoons

Raccoon families are plentiful on the 144 acres and in the neighborhoods surrounding the property. They also eat the tortoise eggs and baby gopher tortoises.

Eastern Spotted Skunk

An eastern spotted skunk was photographed in front of a burrow by the camera traps.

Mouse (Gopher Mouse is threatened)

Photographs of mice at night are hard to identify, but it might be the threatened Gopher Mouse.

Birds

Sandhill Cranes (threatened)

The Florida Sandhill crane is protected by the U.S. Migratory Bird Treaty Act and as a State-designated Threatened species by Florida's Endangered and Threatened Species Rule. (http://myfwc.com/wildlifehabitats/imperiled/profiles/birds/florida-sandhill-crane/)

The cranes nest in the Springs of Suntree Preserve and regularly fly to the 114 acres which is also perhaps a nesting site. On March 1, 2016, there were two Sandhill crane families with new chicks along the west side of Holiday Springs Rd adjacent to the Springs of Suntree Preserve. One pair of chicks was about 8 inches tall and the other about 12 inches tall.

Red Shouldered Hawk

This hawk uses the open land of the 114 acres to hunt. It has been seen hunting in the yards of the Springs of Suntree that are adjacent to the 114 acres. A hawk was spotted on Sept 21, 2016, at 8:00 a.m. in a tree between Ida Way and the 114 acres.

Great Egrets

September 2015 was a particularly wet month. There were many egrets in the basins feeding.

Small birds

Blue jays, Cardinals, Mockingbirds, Thrashers, Finches and many other small birds are in the trees surrounding the 114 acres. If more trees were in the basins, these small colorful birds would be there.

Flora of the 114 acres

In the summer months, the RIB's are covered with wild grasses and wild flowers. It makes it very easy to tell where the gopher tortoise burrows are because they have eaten the grass around their burrows. The prickly pear cactus is plentiful which is a plant tortoises eat.

There are sabal palm trees growing on the sides of the basins. There are some invasive Brazilian Peppers growing in the basins and many around the edges of the basins on the west, north and east sides, creating a buffer between the 114 acres and the surrounding communities. The pepper trees have grown over the berms and will need to be removed.

Cat tails are growing in the middle basins on the east and west. This is a plant that grows in wetlands, and the basins are artificial wetlands, according to a retired environmentalist from NASA. This may be the basin to leave as is for the waterfowl to come to. An old map shows a pond in the middle basin. Small pine trees have sprouted up in several of the basins. Mother Nature is taking back this land.

Meeting with Florida Fish and Wildlife Commission in Tallahassee- Jan 28, 2016

We met with three people who work with Gopher Tortoises, two in Tallahassee and one in Palm Beach on the speaker phone. The lady in Palm Beach works in our area and could come here to see the 114 acres. (She did come in February.)

FWC did not find records of the 114 acres being a legal recipient site for relocation of GT's. However, there are records that workers constructing the shopping center at 7777 North Wickham Rd. relocated gopher tortoises "to the north," and the 114 acres is approximately a mile north of that shopping center.

Gopher tortoises like open, sunny areas. They like ridges like the Atlantic Ridge where the land is located because ridges are high and dry. You rarely find them in hay fields. Controlled fire helps their habitat by getting rid of exotic invasive plants. There is also roller chopping which crushes the vegetation.

A cell tower would be the least invasive of a footprint. Put the tower away from the tortoises and the trees. Make sure to move 10 or fewer GT's onsite with whatever you decide to do. Then you can "bucket trap" them and move them to a different location on site.

A solar farm is not compatible with GT's because they both need the sun. GT's don't walk far, but they do forage in the basins. They won't burrow there, but they eat there.

Relocating GT's is very stressful. We try <u>not</u> to relocate them a second time.

The county estimate of relocating GT's was very low. It is complicated and expensive. It's about $1,700 per tortoise (add $1,000 more for each tortoise). The ways to trap them are very costly. Only move them as a last resort. Backhoes make a giant crater to find them. This is a huge disincentive for selling the property.

Brevard County already owns this land. There are several grants but they are for acquisition of lands, not upkeep.

FWC has grants every July which could be for removal of exotic plants. It is a competitive process.

Volusia County has a "Tortoise Tracker" program and is collecting data from regular citizens.

There is an organization called the "Gopher Tortoise Council" made up of all volunteers. The lady in Tallahassee is the president. They give small research grants ($2,000) for students. There is a GT program at FAU in Jupiter where they are catching and tagging the tortoises. In Lake Wales, the Archbold Center has marked tortoises with temporary paint.

When asked, "What would you do with this property if FWC owned it?" Make a vision first and then get support to do the work. Utilize wetlands with permanent ponds to attract more waterfowl. Keep disking the basins to help the tortoises. Have more diversity of habitat. Do supplemental planting with different zones of vegetation. Go see the "Grassy Waters Preserve."

Walking the property with the experts

Don George, a retired environmentalist from Cape Canaveral Air Force station, walked the property with us on January 18. He worked with sea turtle and gopher tortoise preservation at the Cape. He identified animals on the 144 acres by their tracks and scat. He said the gopher tortoises aren't very active in colder weather. Each tortoise has its own dead-end burrow which is where it lives. He commented that two of the burrows on the SE were huge indicating very old and large gopher tortoises. He noticed the basins are wetlands because of the cat tails and other water plants growing there. We talked about the land possibly being restored to scrub habitat or planting Florida native plants in the basins. Some small pine trees are already growing in the basins.

Rachel King from FWC in Palm Beach came and walked the property with us on Feb 8. She confirmed that there are a lot of adult tortoises on the property. The burrows look active. She said 1% of tortoises make it from egg to adult. The rest get eaten because the eggs are a good food source for other animals like raccoons. She said it would be a wonderful study site for learning more about gopher tortoises. The grass there is not the best diet for the tortoises. They like Florida native plants like legumes and berries. Prickly pear cactus and Florida grapevine are on-site and are good food for the tortoises. She said planting pines (long leaf or slash pines) and palmetto bushes would be good vegetation. She mentioned the Pine Jog Environmental Education Center at FAU as an example of a university and community program that teaches about environmental education. http://www.pinejog.fau.edu/

Restoration of disturbed lands

According to the FWC experts, the land could be restored with different habitats for different species. FWC has given Brevard County money for the removal of exotic species before. Controlled burns by the Florida Forest Service help remove exotic species and are good for the Gopher Tortoises. St. John's water management burn team also does controlled burns. Since the 114 acres are surrounded by housing developments, controlled burns may not be the best way to get rid of the exotic species. Roller chopping to crush the vegetation is also used.

One expert said utilizing wetlands with a wet prairie or grasslands and permanent ponds may draw more waterfowl. Leaving one of the basins alone and not disking it to allow water to drain easily could provide a wet area for wading waterfowl. Having more diversity of habitats with supplemental planting will draw birds and other wildlife. He suggested looking at the grasses now and making zones of planting with different zones of vegetation.

An interesting study would be to do a controlled burn of one or two basins and leave the others alone. Then the health of the gopher tortoises could be compared between the areas.

Mother Nature is already reclaiming the land with trees and bushes. There appear to be scrub oaks growing on the property now which are good trees and native to this property. There are also many invasive Brazilian peppers growing up around the basins which need to be removed. There are many

fern like plants called Dog Fennel growing in the basins. They are native plants but most people consider them weeds and take them out of their yards. These plants have a tendency to repel insects. The two middle basins, located where a pond was originally, have many cattails growing in them which mean they are wetter than the other basins. Could they be restored to wetlands?

Any kind of tree that would grow in the basins would attract more birds.

If the same kind of sandy fill soil that is on the land was dumped in the basins, the higher elevation could allow for the land to be returned to scrub jay habitat. Higher land could allow for more gopher tortoises which don't burrow in the basins because they are deeper and the bottoms of the basins are closer to the water table.

Education and Research

The Importance of STEM Education

According to the US Department of Education, STEM (Science, Technology, Engineering and Math) education is necessary for Global Leadership. According to President Obama in March, 2015, "Science is more than a school subject, or the periodic table, or the properties of waves. It is an approach to the world, a critical way to understand and explore and engage with the world, and then have the capacity to change that world..." He stated a specific goal that within a decade, American students must "move from the middle to the top of the pack in science and math."

The US Department of Education recognizes that learning happens everywhere, so the department is collaborating with NASA, the National Park Service, and the Institute of Museum and Library Services. These organizations are targeting low income students to bring STEM educational experiences. Several other opportunities are described at http://www.ed.gov/stem

Students need to be engaged in what they are learning in the classroom. The best way to accomplish this is through real world discovery. When the Space Coast Eco Geeks incorporated studying the gopher tortoises right here in Brevard County as part of their biology classes, the students were excited to learn.

Brevard Public Schools (BPS) has STEM education as one of its priorities. The BPS STEM team includes the science lead teachers, technology integrators, media specialist, Title 1, and career and technology education (CTE). STEM is growing and the state of Florida is very actively participating. There are new computer science standards that have been added to the science standards. All science classes in Brevard County schools are geared toward the state science standards and the 4 C's of 21st Century Learning: Critical Thinking, Communication, Collaboration, and Creativity. According to a local scientist at Northrup Grumman, the 5th C is Curiosity. STEM is a culture, not a class. Students and teachers are energizing their minds through challenges using STEM principles.

The STEM team has offered many opportunities for STEM training this past year. On September 9, 2016, at the Viera School Board building, there was a mini-conference for public school teachers. This opportunity included 104 teachers: elementary science teachers, middle school science teachers, and media specialists. They were told STEM is more than just an acronym. It is the focus of education for Brevard's students.

One activity showed four pictures of students involved in STEM education. Participants had to choose which picture they thought was most like their view of STEM. 42 of the teachers chose the photo of students seining in the river, proving outdoor education is a high priority in their opinion. The other photos were a young woman with a stethoscope on a child, students standing with their arms up doing a cheer, and a girl doing an experiment with a scientific instrument. While students were engaged in learning in all photos and there were good reasons for choosing each photo, the river photo was clearly the favorite. One teacher summed it up nicely when he said, "It is real world application and hands-on environmental learning. This generation will be the ones who will save our waterways and our planet." Others in that group said the students looked engaged in their small

group. They were learning outdoors and involved in inquiry. (Appendix 1 has the article "Top10 benefits of Environmental Education.")

Space Coast Eco Geeks

In 2015, four Brevard County Science teachers from four different schools: Cocoa High, Edgewood Jr/Sr High, West Shore Jr/Sr High, and Bayside High formed a group called the Space Coast Eco Geeks. They applied for a competitive grant from Northrup Grumman to study at "La Selva" eco classroom in Costa Rica. They were one of only four teams from all over the USA who were chosen to go to La Selva for the first two weeks in August 2015. In Costa Rica, they learned how to set up camera traps to study wildlife. Their proposal stated they would come back to Brevard County to study gopher tortoises. They had originally been working with the Kennedy Space Center to find an appropriate location to study the gopher tortoises.

When the teachers learned the county had just voted not to sell the 114 acres, GREAT! members asked for permission for the teachers to study the tortoises right here in the middle of Brevard County. This was a win/win situation. The land was much closer for all four teachers, so they could go out there frequently to download the information from the cameras as well as to move the cameras around the property. For the county, the tortoises were studied at no cost. Nobody knew much about the tortoises on the 114 acres except that there were likely many of them.

Thanks to the dedication of the Eco Geeks, we now know there are at least 249 burrows on the land. The teachers used GPS to tag the burrows. This is a baseline study for the future. Exactly how many tortoises live there is still a question, but indeed, there are a lot. They are very active. They were mating last fall which should have resulted in baby gopher tortoises. However, there are bobcats and raccoons on the land, predators which eat the gopher tortoise eggs and baby tortoises.

The teachers had thousands of photos from the camera traps. Their students sorted through the pictures and categorized the animals. Everyone enjoyed this activity very much as is evident in the following testimonials.

Messages from the Space Coast Eco Geeks

"I think it is wonderful to have access to the site. With it being so close it gives both easy access to both the teachers and the students. After just one visit it was apparent that the number of projects students can get involved with is almost countless."

Ryan Cilsick

Edgewood Jr/Sr High School

Biology Teacher and Science Department Chair

"Having access to use the 114 acres for scientific study has already been a great asset to my students. Though they aren't able to visit the site in person, they have had the opportunity to help set

up the cameras and to analyze the photos that we have collected. During the few months that our cameras have been set up at the site, we have already collected thousands of photos. From bobcats and raccoons to tortoises and birds, the variety of wildlife has surprised us all. As teachers, we have made these photos available to our students and had them help to mine the data in them. They have been surprised and excited to see how much wildlife is living so close to their own homes. As they go through the photos, they get so excited to see the comings and goings of the animals and watch their activity change through time. As teachers, we appreciate the opportunity we have had to share this site with our students. Though we do not know the ultimate fate of the land, I join my students in hoping that it will continue to offer inspiration to us all."

Sincerely,

Angela Feldbush

West Shore Jr/Sr High

Biology Teacher

Student thank you notes

At the beginning of the school year, Mrs. Feldbush had a wish list for camera traps for her own classroom. Some GREAT! members donated to her cause at www.donorschoose.org.

Several of her students wrote us thank you notes. They really enjoyed looking through the many photographs of the animals on the 114 acres. This is real world science, not just reading from textbooks! Some student reactions were: "The experience to see the camera traps in action and all the wonderful pictures of animals and their behaviors really were great hands-on experience. We work all year in textbooks and computer simulations, but to see it in reality is inspiring and amazing for a different perspective." "By using the camera traps, we learn about the type of animals that inhabit the plot of land. This leads to greater understanding of our community." "Within the Suntree/Viera area, so many areas are being bought and developed, so it's refreshing to see that this land will stay "pure Florida" for many years to come."

Further study of the gopher tortoises by the Eco Geeks and their students will depend on what happens with the land. If the commission goes for our proposal to keep the land for STEM education, many more studies of the tortoises and other animals could continue.

Sat, Oct 31, 2015 Space Coast Eco Geeks Photographs

The next step will be to put out more cameras and continue to explore different burrows. The cameras were secure while they were there, so I think that they should continue to be pretty safe. There was one photo of someone looking at the camera, but obviously he didn't take anything.


11/06/2015 12:39:08 40℃


11/06/2015 11:55:07

Bobcat checking out a burrow.
What's for supper?

02-06-2016 22:0

01-07-2016 04:05:06

Many animals gain access to the 114 acres through a hole in the fence by the wetlands.

STEM Education Possibilities

STEM education involves asking questions and allowing people to use critical thinking, communication, collaboration, creativity, and curiosity to solve problems. Here are examples of questions that need to be answered by environmental experts, engineers, professors, teachers, and students at all levels of education.

1. **What plants and trees will grow in the low basins?** They have to be plants that don't mind "getting their feet wet" since the water table is only 2 feet below the basin bottom. Any trees will attract more birds which will attract birding enthusiasts and photographers. One of the basins showed a pond in old maps, so that might be a place where wetlands could be restored.
2. **Can the elevation of the basins be raised to make a better gopher tortoise habitat?** If there were more high berms, there would be more space for the tortoises to dig their burrows. But is it possible?
3. **What flowers can be planted to attract more pollinators?** Bees, butterflies, and wasps are in danger of disappearing due to habitat loss. Loss of pollinators directly affects our entire ecosystem.
4. **Is this land a good location for bee hives or bat boxes?** Bats eat lots of mosquitoes. There is a concern about the spread of diseases such as Zika, Dengue, and Chikungunya due to mosquitoes.
5. **Linking with the history of the land, how did the early settlers live?** How do you build a log cabin? How do you build an Ais Indian hut?
6. **How can we make Hundred Acre Hollows accessible to all Brevard citizens?**
7. **How and where can you build a picnic pavilion or a gazebo?** There are no shade trees in the Hollows, so there needs to be something covered where people can get out of the sun and gather together.
8. **How can we make sure "Hundred Acre Hollows" is totally energy sustainable?** By using solar power for electricity, cisterns for gathering rainwater, etc.
9. **How can modern technology be used in restrooms?** Since the land is approximately ¾ mile from north to south, there is a need for restrooms.
10. **How can modern technology be used for education?** Solar powered kiosks, educational signs where people can telephone to hear a recording about the area, etc.

Most of these possible ideas will require research, thinking out-of-the-box, collaborating with experts, and working together in groups. These are only a small number of questions that educators and researchers can begin to address at Hundred Acre Hollows.

Outdoor Classrooms

The Environmental Learning Center in Vero Beach

The ELC in Vero Beach is located on an island in the Indian River Lagoon. It is a model of a sustainable environmental center using solar power and cisterns to catch rainwater to flush the toilets. The paneling for the buildings is made of recycled plastic. The buildings are built on stilts rather than a concrete foundation so that the rainwater can still filter down into the soil. There are rooms with displays and a touch pond for people to learn about sea life such as hermit crabs. There is an elevated boardwalk which winds through the mangroves. The outdoor classroom is made of recycled wood. There are outdoor signs with telephone numbers that visitors can call using their cell phones to hear a nature recording to learn about the area they are in. There are memorial benches and memorial planks in the boardwalk.

If any building is built in Hundred Acre Hollows, in order to demonstrate sustainability, it should be modeled after the ELC.

The outdoor classroom at the ELC. This could be an Eagle Scout project.

A gazebo at Turkey Creek Sanctuary

This screened outdoor classroom is at Sam's House on Merritt Island.

Networking with Educators

The Space Coast Science Education Alliance (SCSEA) is a group of science teachers and science professionals in Brevard County. They meet once a month to share what their organization is doing to promote science education in the county. Members include representatives from Brevard County Natural Resources, Brevard County Solid Waste Management, Brevard Public Schools, the Brevard Zoo, UCF Solar Center, Marine Resources Council, universities, 4-H club, kayak clubs, the City of Melbourne Environmental Programs, retired university professors and science teachers, and others. Members of GREAT! were welcomed as guests several times this past year. Once the Hundred Acre Hollows has non-profit status, we can officially join SCSEA.

At the September 20, 2016 meeting, someone said the SCSEA is the best kept secret in the county! The director of the Brevard Museum of History and Natural Science was there. She was very interested to hear that the Hernandez Trail goes through the 114 acres. All the people were amazed to learn of the many gopher tortoises and other animals that live on the 114 acres.

In addition to the SCSEA, GREAT! members have networked with university professors. Florida Institute of Technology has a new Sustainability major. Science professors and graduate students are interested in studying the gopher tortoises and their habitat. We have also talked to interested professors at Eastern Florida State College and the University of Florida who may be interested in researching the ecology of Hundred Acre Hollows.

Community Engagement

Community Support

We have supporters from all over Florida and even other states. Many Americans are interested in saving green spaces and wildlife. We did not use the internet or social media, following the instructions that at least one of you "didn't want to read about our project in the newspaper or online." As of the date when this had to be submitted to the county, we have names and zip codes from residents all over Brevard County and from other parts of Florida. We also have signatures from CA, MN, NY, AL, SC, NC and PA. The actual names will be submitted when we do our presentation before the Board. Refer to Appendix 2 to see the survey we showed to people to get signatures.

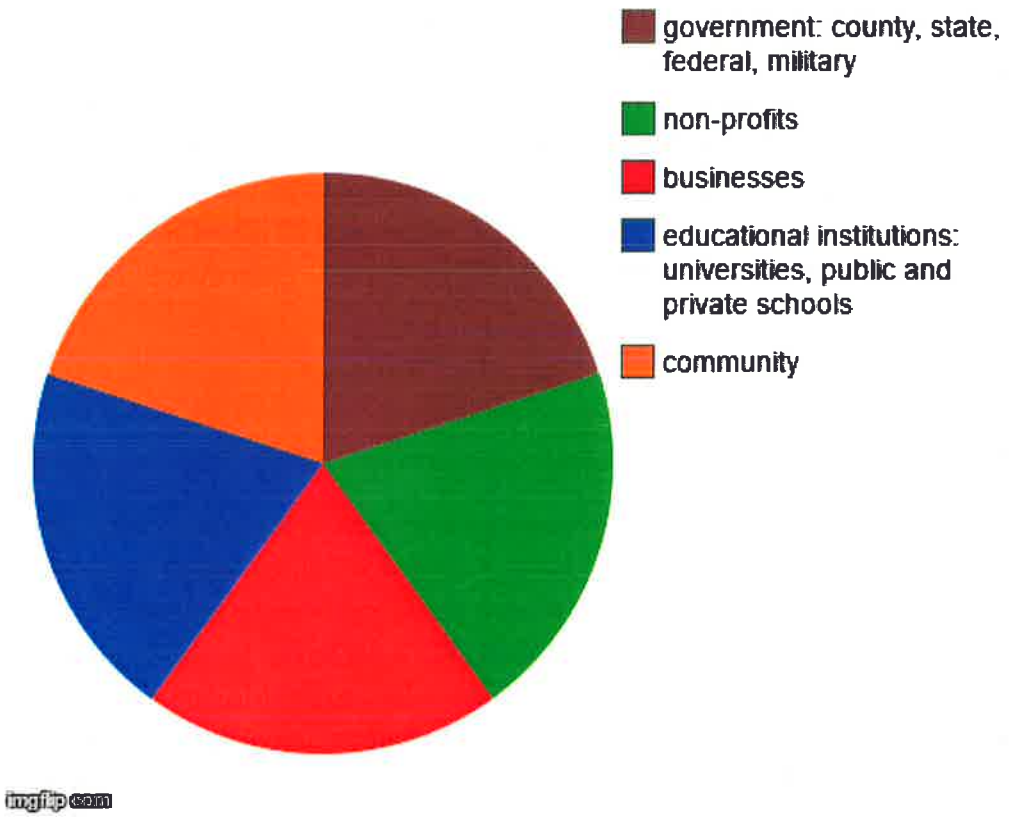
Networking with other Non-profits and Civic Groups

GREAT! members are involved or have contact with many other non-profits. In addition to meeting with gopher tortoise experts from the Florida Fish and Wildlife Commission, we have talked to people in the Sierra Club, Nature Conservancy, Audubon Society and at EEL nature centers and the Environmental Learning Center in Vero Beach. We have talked to Master Naturalists, Boy Scouts, garden clubs, and Lions Club members. We have talked to the Military Officers' Association of America Cape Canaveral Chapter (MOAACC), a group of active duty and retired military officers here in Brevard. We have talked to churches and youth group leaders. There is much interest in saving this land for the animals that live there and enhancing people's lives keeping it as a green space right here in the center of Brevard County. People are eager to become involved and want to know how they can help.

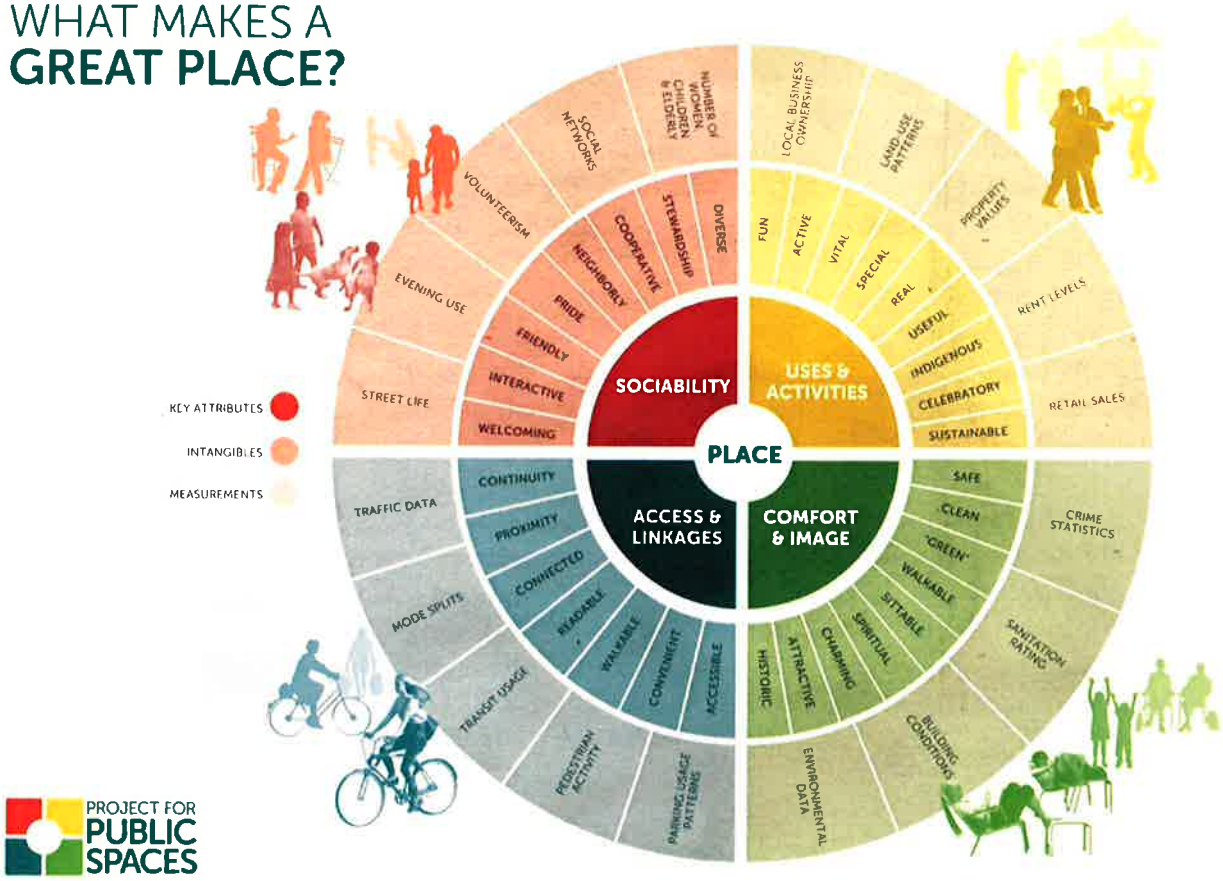
Placemaking

"Placemaking" is an international movement where groups of people plan together for an open space in a community. We envision a place planned and created by many entities: the residents and others in the community, non-profits such as environmental groups and garden clubs, graduate students and elementary students, teachers and professors, businesses, and government. There are many stakeholders who each benefit from the collaboration. With many organizations and great minds involved, an open space can be turned into a center that connects people together. The space can enhance and enrich people's lives. We will need volunteers who like to get out in nature.

Brevard companies are well-known around the country, and they want to attract millennials. Open green spaces, preserving wildlife, and caring for the environment are important values for young people.



This graph shows the 5 different entities that will help decide what happens in Hundred Acre Hollows. It does not mean each entity will necessarily have the same amount of work in the creation process; rather it is a partnership made up of 5 different groups.



http://www.pps.org/reference/grplacefeat/

UF/IFAS encourages the local community to take action in planning development.
The five stages of development are:
1. ***Initiation***, promoting awareness of the issue related to the action.
2. ***Organization of sponsorship***. This step addresses the structures, organizations, and resources available within and outside of the community.
3. ***Goal setting*** and strategy development for achieving community-decided goals .
4. ***Recruitment*** and mobilization of needed resources including people, funds, and materials.
5. ***Implementation*** of plans to achieve the desired goals. At this stage, specific actions are taken, assessed, adjusted, and implemented again. (Appendix 3 is the full article.)

We have been working on the first four stages for the past year. We haven't had permission to recruit donors for funding yet.

Nature and Health

The physical and mental health benefits of exercise in nature are well documented. Being outside clears the mind and engages the senses. According to Ming Kuo of the University of Illinois, "Creating green spaces is a powerful public health intervention. The range of specific health outcomes tied to nature is startling, including depression and anxiety disorder, diabetes mellitus, attention deficit/hyperactivity disorder (ADHD), various infectious diseases, cancer, healing from surgery, obesity, birth outcomes, cardiovascular disease, musculoskeletal complaints, migraines, respiratory disease, and others, reviewed below. Finally, neighborhood greenness has been consistently tied to life expectancy and all-cause mortality." People of all ages benefit from just 30 minutes a day outdoors. In contrast, people who exercise indoors on a treadmill or walk in the streets of a city do not gain as many health benefits as those who take a 30 minute walk outside in nature. Research has also shown that people who are in nature brood over their worries less and are less depressed.

While it has been proven that aerobic exercise, such as an hour hike that can burn 400 calories, is good for one's body, it also has unique mental health benefits. Citing a study presented at the National Academy of Sciences, Pirrone (2016) states that hiking in a natural environment lowers the blood flow to the subgenual prefrontal cortex which is the part of the brain associated with bad moods. A walk in the city doesn't have the same effect on the brain. A good hike can also reduce the symptoms of ADHD. Americans now spend over 90% of their time indoors. Providing a space for people to enjoy Brevard's natural beauty will have significant physical and mental health benefits for our citizens and their guests.

The veteran population of Brevard County is a vital and important part of our community. There are many health benefits for Veterans with PTSD who spend time outdoors in nature. In fact, PTSD is not just a military war zone problem. Anyone who has experienced a sudden terrifying threat or event such as a robbery at gun point, being shot, or a terrible accident can show signs of PTSD which are: flashbacks, bad dreams, avoiding places that are reminders, racing heart, feeling on edge, difficulty sleeping, angry outbursts, and losing interest in activities they enjoy. Spending time in nature and working in the outdoors in landscaping or on a farm can help restore people's health and well-being (Hausermann, 2015). Any kind of terrible loss can cause depression in people. Spending time in nature every day can really help people's well-being. For example, the death of a loved one, takes a terrible emotional toll on people.

The Compassionate Friends (TCF) is a support group for bereaved families after the death of a child. Sometimes bereaved parents' children have died in another state. The local Space Coast TCF Chapter has wanted to have a memorial garden in Brevard County. Right now, there is no special garden for parents to visit if their child is buried in another state. A butterfly memorial garden on the property would be a blessing to these families who have lost a child. An idea for raising funds would be to have memorial bricks or memorial planks like in Turkey Creek sanctuary.

Another idea is to make a labyrinth which is a unicursal path to a center. The way in is the way out. Labyrinths are ancient symbols that relate to wholeness and have long been used as meditation tools. They are often built at churches and hospitals as a healing path for people to walk. As the person turns right and left, it is good for balance and centering the body. While some labyrinths are made with lines drawn on cement, which would not be possible on this land. Labyrinths can also be made with bushes on either side of the path, stepping stones to line the path, rubber pieces to line the path, etc. It would need to be made with no impervious materials, so the rain can drain through the soil.

Children in Nature

Alongside the physical and mental health benefits of nature on the general population, children are especially susceptible to both these benefits but also the consequences of not having exposure to nature. One study has shown that children are spending less time outdoors than prison inmates – a fact that was surprising to the inmates who said that they thought that would be depressing (Goodrich, 2016). In contrast, children in Scandinavian countries spend significantly more time outdoors than their American counterparts. In Norway, for example, preschool children in some schools spend less than 2 hours per school day inside! Certainly by working with teachers and schools, the 114 Acres can offer more opportunities for children to learn in nature, to expand their imaginations, and to promote their physical and mental well-being.

Robert Louv has written several books about children in nature: Last Child in the Woods, the Nature Principle, and Vitamin N. The latter has a subtitle of "500 Ways to Enrich the Health & Happiness of your Family & Community and Combat Nature Deficit Disorder." He says that lack of time outdoors in nature is harmful for our children. Kids aren't playing outdoors like they used to. In school, they have to sit for long periods of time while recess gets shorter. He writes about a little girl who loved going in the woods to see a waterfall. After a little while outdoors, her mood was always better, and she felt happier. Then one day, the woods near her house disappeared to development. Vitamin N is filled with hundreds of activities for families to do together outdoors. One of his suggestions is entitled: "How Family and Friends Can Help Create a National Park." (p. 86) One way to do this is to plant native plants in our yards. Another is to get the community to plant native plants on the 114 acres! Another suggestion is to "Help restore habitat on land or in water." People are already involved in helping restore the Indian River Lagoon. Restoring this land is another opportunity to involve children and families. Another suggestion is "Belonging: Make your city the best in the nation for connecting families to nature." We have several opportunities right here in our county. Louv says we need to build a vision: "Reconnecting today's children and families to nature is an issue that brings people together across political, religious, and economic barriers like no other. (p. 229). In the Nature Principle, Louv talks about going "beyond sustainability" which is better than protecting the environment; it is creating new environments. He says environmentalism's motto should be "to conserve and create." (p. 257). The Springs of Suntree has a yearly activity calendar. Penciled in for April 2017 is a community work day helping restore Hundred Acre Hollows.

There is a new White House movement as of September 2015 called "Every Kid in a Park." It is a plan to provide every 4th grader and their families with free admission to our national parks and other federal lands and waters.

Goodrich, A. (April 7, 2016). Kids now spending less time outdoors than prison inmates... total detachment from the natural world breeds mental illness. *Natural News.* Retrieved from http://www.naturalnews.com/053578_prison_inmates_outdoor_time_modern_kids.html#ixzz4GaTwshiV

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Historical Preservation

The Ais Indians were some of the first inhabitants of Brevard County. They were here when the Europeans began to explore Florida in the 16th century. Ponce de León stopped in Ais territory in 1513. The Ais stayed in this area because of the warm climate and the plentiful food from the ocean. They were non-agricultural, surviving on fish, shellfish, manatee, deer, and plants. Their houses were wood with palmetto thatched roofs. They were feared by neighboring tribes and the Europeans because they were known to be cannibals. Shipwrecked Spanish sailors were afraid of the Ais because they were "inhospitable." It is thought that a few Ais survivors may have emigrated to Cuba when Spain left Florida in 1763.

The historic Hernandez Trail went right through the 114 acres. The Enchanted Forest Sanctuary, of the Environmentally Endangered Land program, has a part of the Hernandez Trail which was cut in 1837 by the army under General Joseph Hernandez during the Second Seminole War. His troops followed old Indian trails that were on high ground now called the Atlantic Ridge which is about a mile wide and averaging 30 feet above sea level. The road went from St. Augustine to Ft. Pierce, connecting army forts. There is a historical sign on Hwy 520 in Cocoa that says the trail went ½ mile west of US 1. The housing subdivision to the north of the 114 acres, Capron Ridge, has a trail marker for the Capron-Hernandez Trail. The 114 acres is about ½ mile west of US 1. A visit to the Cocoa Historical Society uncovered an 1844 land management survey that shows the historic Hernandez Trail going right through the middle of plots 2 and 11, which are the 114 acres. The road was used for many years while settlers moved into Florida.

No Indian archeological finds would be there now since the 6 Rapid Infiltration Basins were built 30 years ago, and the land was dug up then.

The history of the area includes a 1944 photograph showing scrub plants on this land.

The Seminole Wars

Major General Thomas Jesup had fought in the War of 1812. President Andrew Jackson, former governor of the Florida territory, tasked him to get rid of the Seminoles in Florida. It was the country's first large scale guerilla war. In the winter campaign of 1837, Jesup came up with a plan to divide the army into four columns, all heading south in Florida. The total force of the four columns was about 9,000 men. General Joseph Hernandez's troops were divided into two columns that took the area between the St. John's River and the Atlantic Coast heading to Lake Okeechobee.

Joseph M. Hernandez

Joseph M. Hernandez was a native of Saint Augustine of Spanish descent and a plantation owner who later became the Florida territorial delegate to Congress. The US government had no intention of offering citizenship to the Seminoles or other Native Americans in the Florida territory. They decided to confine the Seminoles to a reservation in the south of the Florida territory. Brigadier General Hernandez of the St. Augustine militia was eager to help to defend the city. In September 1837, his men captured King Philip, a powerful Seminole chief. Then they captured chief Yuchi Billy.

Brigadier General Hernandez is known especially for capturing Chief Osceola and Coa Hadjo on orders from General Jesup. On October 21, 1837, Hernandez left St. Augustine with his army column to meet Osceola. Osceola's camp, seven miles away, had raised a white flag, not of surrender, but of a truce. Hernandez had orders to read the message from General Jesup and interrogate them with many questions. When Osceola didn't answer, likely due to not understanding, Hernandez had orders to arrest them and take them to Ft Marion prison which was the Castillo de San Marcos. The soldiers quickly surrounded Osceola whose men didn't have time to react, and if they had, they would all have been killed. Instead, the army captured 95 Seminoles and marched them back to St. Augustine where Hernandez paraded them through the streets. Chief Osceola was ill at the time with malaria and quinsy. He died on January 30, 1838, at 34 years old, at Ft. Moultrie in Charleston, SC. He was the most famous Native American, and a martyr and hero among the Seminoles. (Osceola and the Great Seminole War)

Major General Thomas Jesup's order to capture Osceola stained his reputation. "There can be no question that the controversial capture of Osceola under a flag of truce stands to this day as one of the most disgraceful acts in the American military history." (Osceola, p 221) In Jesup's defense, he listened to his subordinates, General Eustis, Colonel Twiggs and other officers who urged him to write War Secretary Poinsett asking for a change in policy. On February 11, 1838, he wrote, "My decided opinion is, that unless immediate emigration be abandoned, the war will continue for years to come, and at constantly accumulating expense." (Seminole Wars, p 146) His letter took two weeks to arrive in Washington. Before he received Poinsett's answer to continue the offensive to capture or destroy the Indians, Jesup pleaded again, "To persevere in the course we have been pursuing for three years past would be a reckless waste of blood and treasure." (Seminole Wars, p 147) Interestingly, Poinsett had been the country's first ambassador to Mexico who brought the Poinsettia plant to the US. Poinsett was following the policy of former President Andrew Jackson. Van Buren was the president in 1838, but Jackson was still very influential in politics. Van Buren and Poinsett, under Jackson's influence, were not going to go back on the Indian Removal Act because admitting the policy was an error was unthinkable. The Seminole War continued "as Jesup had warned, with a 'reckless waste of blood and treasure'." (Seminole Wars p 150)

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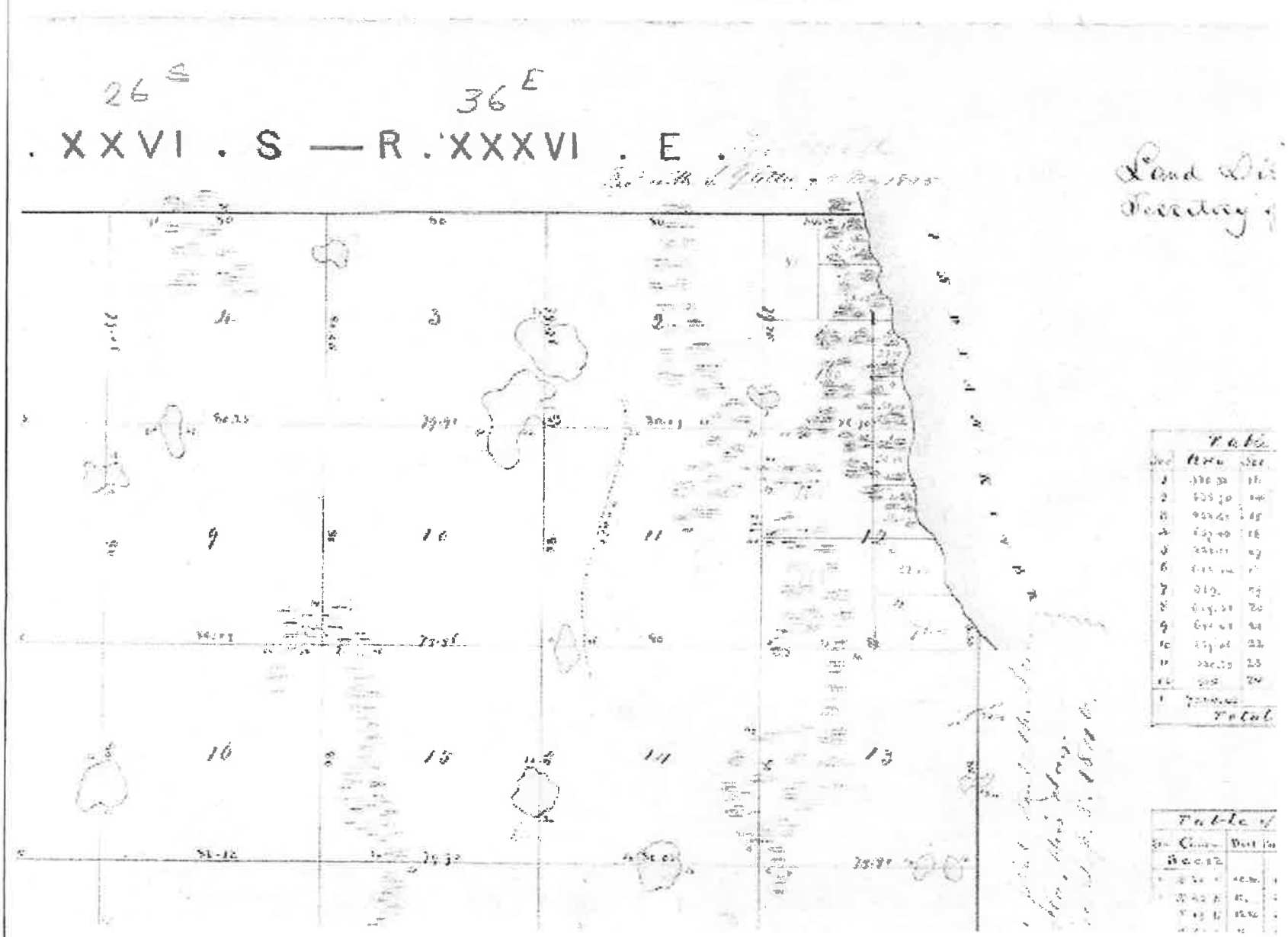
The Importance of Historical Trails

The current issue of the magazine Adventures in Florida Archaeology, has an article on the importance of trails. It is "Trails Are Artifacts, Too: Can Lead Us From The Present into the Past" by Jerald T. Milanich, PhD, Curator Emeritus of Archaeology Florida Museum of Natural History, Emeritus Professor of Anthropology, University of Florida. Portions of the local, state, and federal roads in Florida, as well as the railroad tracks, follow earlier paths and trails that date from the 1820's and 1830's or earlier. The article describes the history of the Mission Trail or Camino Real in northern Florida. Maps and diaries from research in Florida, Cuba, and Spain discovered new information about the missions and the roads that connected them. Milanch says, "An artifact alone tells us little. But when it is placed in its cultural, historical, and geographical context our ability to describe and understand past human behavior is greatly enriched." Perhaps we can learn more about the Hernandez Trail and its importance to the army in 1837 and pass this information along to future generations.

The Hernandez Trail Map

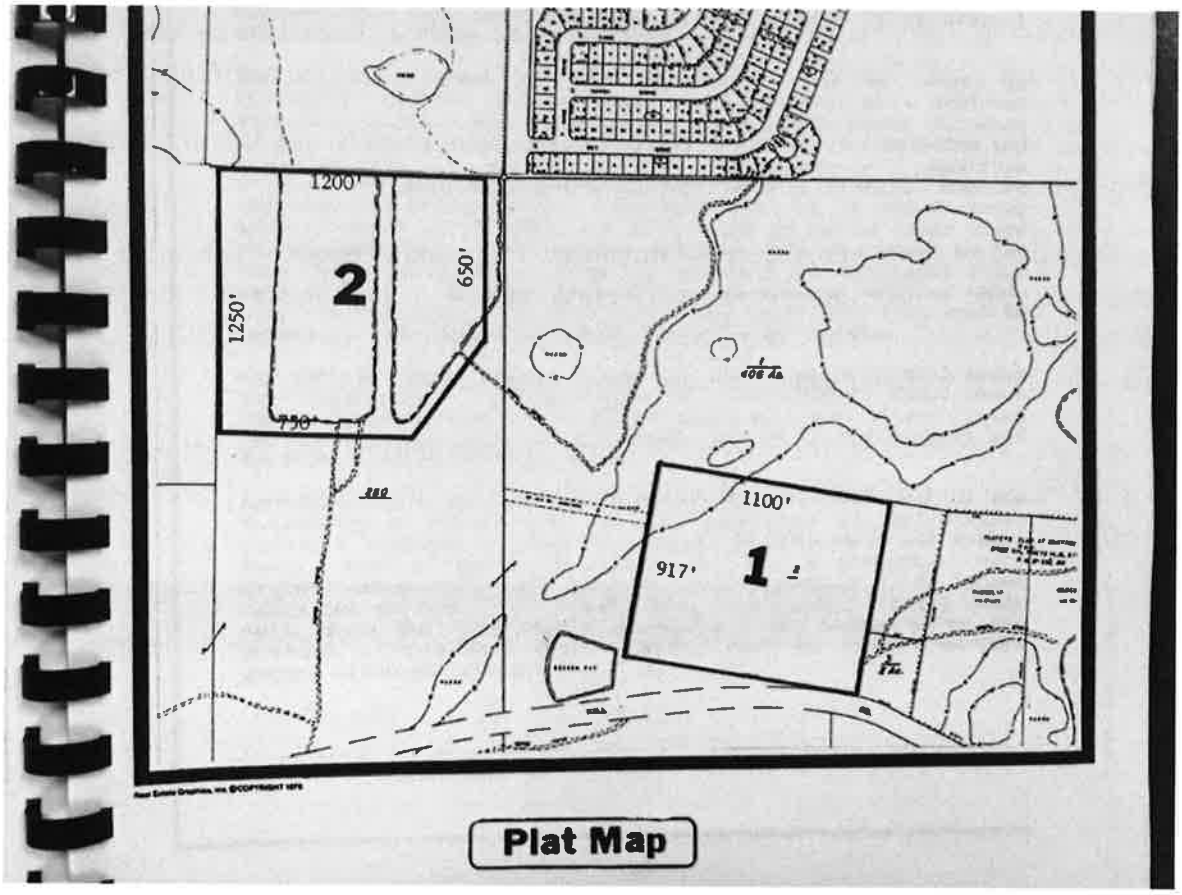
The Hernandez Trail map is on the following page. It is the dashed line on coordinates 26 S and 36 E, plots 2 and 11 which is the 114 acres today. The trail likely goes through the Cruikshank Sanctuary on Barnes Blvd which is also ½ mile west of Hwy US 1.


26 E
36 E
. XXVI . S — R . XXXVI . E .

Infrastructure

Construction of Rapid Infiltration Basins- 1985-1990

This old map shows "Turtle Mound Rd" which is now called Holiday Springs Rd. The road went straight to the 114 acres, then along the eastern side, and then cut through to the south to go to the future Spyglass Hill Rd. It would have gone through Devons Glen and Mandarin Lakes neighborhoods.



This map from 1985 clearly shows a pond at the top of the photo. This is now the middle basin which has cattails growing in it. This planned map of Magnolia Springs subdivision originally had the street adjacent to the 114 acres. Then in 1997, the five commissioners on the Board at that time approved a new plat which has houses all along the 114 acres except for the platted 40 foot Blue Springs Rd. which would be between two houses on Rock Springs Rd, a 58 house cul-de-sac. There was no provision for a good entrance to the 114 acre property likely because nobody thought there would be a need for it. The fact that Rock Springs Rd is a 22 ft. road like all the roads in the Springs of Suntree seems to indicate it was never intended for use as an entrance for constructing a future community of houses or commercial area. Rather, it might have been intended for an entrance for workers to access the northernmost basins to repair a break in the pipes or for maintenance of the trees.

School busses do not come into any of the streets in the Springs of Suntree. They stop at the Springs of Suntree Clubhouse on Holiday Springs Rd which is a 40 ft. wide road that leads to Palm Springs and Magnolia Springs which have 325 houses, all of which exit the neighborhoods onto Holiday Springs Rd. The sanitation trucks sometimes have difficulty coming down the narrow streets if cars are parked on the streets. It is hard to imagine how construction trucks could go in and out of this 22 ft. wide road every day for years until houses are completed.

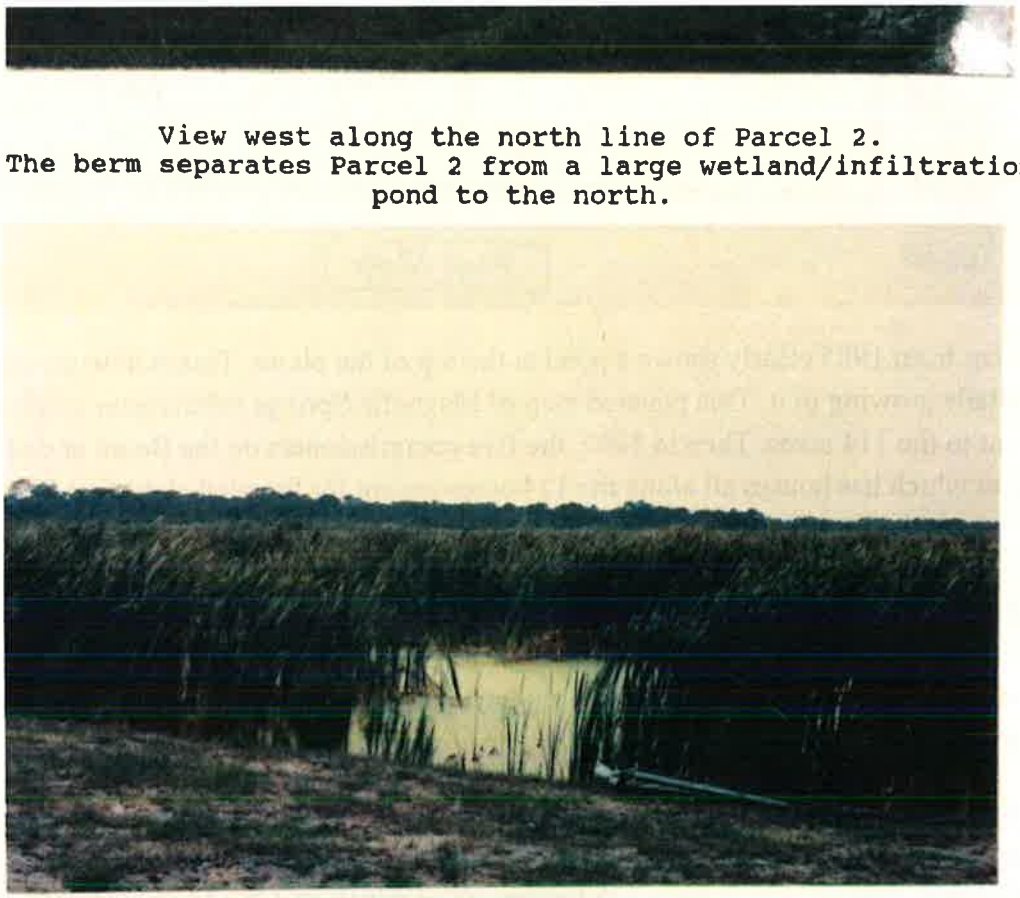
Adding 200 more houses on this land with possibly 400 more cars would have a severe negative impact on these quiet cul-de-sacs. Additionally, that many more cars would make the already F-rated intersection of Holiday Springs Rd. and Viera Blvd. more of a problem than it already is. It is very

difficult to turn there because of poor visibility. Cars in the left turn lane on Holiday Springs Rd. trying to turn onto Viera Blvd. impede the vision of the driver of the car turning right and vice versa.

Cars can also turn south onto Pinehurst Rd to Wickham Rd. or Spyglass Hill Rd. Those roads are already busy, and Spyglass Hill Rd. is only a two lane road.

In 2005, the 114 acres were cleared of the invasive Brazilian Pepper trees by a large group of county volunteers. The gopher tortoise burrows were counted with an estimate of 300 + tortoises. When the property was transferred to Central Services for a possible sale in January 2015, the tortoise estimate was 400. The Brazilian Pepper trees are again all around the 114 acres.

Now the 114 acres are surrounded on the north by Capron Ridge and the Springs of Suntree, on the east by the Springs of Suntree, and on the south by Mandarin Lakes and Devon's Glen. There are wetlands to the west of the property.



View west along the north line of Parcel 2.
The berm separates Parcel 2 from a large wetland/infiltration pond to the north.

View of the large wetland/infiltration pond north of Parcel 2

This photo clearly shows wetlands on the 114 acres originally. This area is now part of the RIBS, but it is usually wet. When it rains a lot, this is a nice area for water birds, and it could be better with some plantings. Ducks have been seen swimming in this basin, and water fowl often wade in it.

This report is taken from County Application 1719 received on 5/24/85.

"SUNTREE WWTP EXPANSION PROJECT STORM WATER MANAGEMENT CALCULATIONS

Project Description

The Suntree Wastewater Treatment Plant Expansion is a Brevard County Environmental Services Division project that involves the construction of six percolation ponds for the purpose of wastewater effluent disposal on an 80-acre parcel owned by Brevard County and an adjacent 56-acre parcel leased to the County for five years. This project will meet an interim need for wastewater disposal capacity, and these facilities will be replaced within five years and taken out of service.

The proposed construction is delineated in the engineering plans which are enclosed as a part of this application. It is appropriate to note that no structures, pavement, or other impervious surfaces are proposed for construction.

Location and Site Description

The site is located in the East 1/2 of the West 1/2 of Sections 2 and 11, Township 26S., Range 36E., in Brevard County, Florida approximately 1600 feet west of the Suntree wastewater treatment plant. For location map and soils map, see the attached report entitled "Summary Report Site Investigations Suntree Area Effluent Disposal."

Pre-development Conditions

The proposed site is primarily pine flat woods with scattered oaks, scrub oak, and scrub palmetto. Under pre-developed conditions, the site is divided into two basins. Basin "A", the westerly 2/3rds of the site, generally drains in a west, southwest direction. Basin "B", the remaining easterly portion of the site, generally drains toward the east. Basin "A" contains a small depression which was considered in the hydrologic calculations.

Primary SCS soil types occurring on-site are Immokalee, Myakka, Myakka ponded, and Pomello sand. Curve number and time of concentration calculations are shown on Figures 1 through 4. Stage-storage and stage-discharge computations are shown on Figures 5 and 6.

Summary

The proposed construction will not increase storm water discharge rates or volumes above pre-project conditions for those storm events analyzed; thus, meeting Rule 40C-4 criteria.

The potential impact of impoundment failure is minimal and the probability of impoundment failure is also very low. Careful inspection and testing during embankment construction will be provided on a full-time basis by experienced County personnel in addition to site visits to be made by the design engineer. The finished berms will be broad and well compacted, and protected against erosion damage by soil stabilization, seeding, and sodding. Areas adjacent to the impoundment which might be impacted by failure of a berm are undeveloped." (The last sentence of the report was written in

1985. The surrounding communities were built from approximately 1995 until now. There are many houses in the areas adjacent to the impoundment.)

A compilation of County Reports

In 1989, Brevard County enacted the aquifer protection ordinance 89- 12 which is designed to protect the area's water supply and provides limitations to development of affected parcels.
Determination of a property's location within an aquifer recharge area is based on the type of soil that is found on-site. Highly drained soils such as those found in Parcel 1 and Parcel 2 indicate that they are in an aquifer recharge area, according to the county office of Natural Resources Management.

The intent of this ordinance is to limit the impervious surface area of any development of aquifer recharge parcels. Depending on the importance of the site for aquifer recharge, impervious surface areas such as building roofs, parking, walks, driveways, streets, etc. must be limited on the site. These restrictions severely limit the development potential of commercial sites, but detached single-family residential development is typical within these parameters. Still, it is important to be aware of the ordinance itself and potential restrictions to development which it may cause.
The fact that the site was formally a wastewater treatment plant and retention ponds will likely have an adverse effect on any development.

Parcel 2 is surrounded on three sides by additional developed acreage. On the north is about 80 acres of the rapid infiltration basins. For all appearances, these are impounded wetlands, enclosed by earthen berms. They hold treated effluent pumped in from the county's treatment plant west of I-95 and were densely vegetated with cattails. At one time parcel number two had no legal access until Blue Springs Road was initiated.

With access now available, parcel 2 will be suitable for residential development. The only potential adverse condition would be the adjacent effluent basins and the stigma of a development on land formerly used in conjunction with a wastewater treatment plant which will have an adverse effect on its value.

Highest and best use!

The value of real property is directly related to the use to which it can be put. It follows that a particular parcel may have several different value levels under alternative uses. Accordingly, the property appraised here is appraised under its highest and best use. According to The Appraisal Institute, highest and best use must be: 1 physically possible, 2 legally permissible, 3 financially feasible, and for the use producing the highest value maximally productive.

Highest and best use may be defined as follows: The reasonably probable and legal use of vacant land or an improved property which is physically possible, appropriately supported, financially feasible and that results in the highest value.

Source: Appraisal Institute, 1992 the appraisal of real estate, 10th edition page 275

Highest and Best use is shaped by competitive forces within the market where the property is located. It is an economic study of market forces, focused on the subject property. The benefit that an amenity

may contribute to the development of a community is not considered in the appraiser's analysis of Highest and Best use.

The subject property is zoned PUD and approved for residential uses with a maximum density of eight units per acre. The county's land use plan calls for residential uses with a maximum density of 12 units per acre.

The percolation ponds were completed in July 1985 and the discharge of sewage plant effluent into these ponds began at this time as they became available for use.

The subject site is comprised of three contiguous parcels. Tax account number 2600708 is the northern parcel and is 40 acres in size. Tax Account number 2600710 is the middle partial and is 40 acres in size. Tax account number 2618239 is the southern partial and is 34 1/2 acres in size. The subjects total land area is 114.5 acres or 5,000,000 ft.^{2}.

The northern two parcels are rectangle in shape and the southern parcel is mostly rectangle but somewhat irregular in shape.

The property could achieve access from Blue Springs Road which is a legally platted but undeveloped roadway. It could act as the main entrance for a residential subdivision. It is located in between two existing single-family homes and is an open grassy and wooded lot currently. Between the two homes, the width of the road is about 40 feet wide. Beyond the two homes it widens to a width of 65 feet.

A secondary, emergency access could be achieved by an existing driveway that abuts the property's southern parcel. This access easement driveway is known as Tract S of Devons Glen Homeowners Association. According to the assistant fire marshal of Brevard County, Tract S is already being used in an emergency manner for the property.

The property in its existing size, shape and access is adequate for 200 residential units. The platted Road known as Blue Springs Road is also adequate for a "cattle grazing" use. (Note: yes, that is in the county document.)

The neighborhood has availability to water, sewer, telephone, electricity and gas. Brevard county utility department and the city of Cocoa provide water and sewer. Florida Power and Light provides electricity, while BellSouth provides telephone service. Infrastructure is adequate to meet the needs of the population. It should be noted that the city of Cocoa did not respond to the concurrency report regarding utilities for a residential development.

Based on visual inspection, the property is about 10 to 15 feet above the grade of surrounding properties. The retention areas have a depth of about 10 feet and are separated by spine roads. The existing built-up interior roads and berms could be leveled into the low areas.

According to the County appraisal of 2015, the property has an estimated 400 gopher tortoises that will cost between approximately $ 700-1,200 each to remove. The total approximate cost to remove all gopher tortoises could be as much as $300,000 to $500,000. Relocation would require an approved site with Florida Fish and Wildlife Conservation Commission chapter 68A – 27.003 Florida administrative code regulates relocation revised February 2015. (Note: In a meeting in Tallahassee in Jan 2016, we were told the actual relocation cost per gopher tortoise is at least $1,700.)

The property lies in census tract 631.07. This tract had a 2014 estimated median family income of $83,000 per year and a population of 9000 people.

The property lies within flood zone "X" and flood zone "A" according to the flood insurance rate map prepared by the national flood insurance program of the US Department of Housing and Urban Development, dated March 17, 2014. Flood zone "X" indicates an area outside the floodplain and flood zone "A" indicates an area inundated by 100 year flooding in a special flood hazard area.

General upkeep and security of the property

The 114 acres was maintained by the utilities department and natural resources. The contract called for quarterly mowing, and it was (as it the standard practice) awarded by a competitive bid process overseen by Purchasing Services. Mowing was also performed by Utility Services staff, but that was before using outside contractors in an effort to achieve cost-savings. The most recent bids received to mow the RIBS property ranged from $12,800 to $34,000 annually. The basins were disked periodically to allow the water to drain easily into the ground.

It was suggested by the people at FWC to continue to disk the basins for the welfare of the gopher tortoises who like dry land to forage for food. Perhaps we could disk around the sides of the basins to allow drainage.

The property is not secure. The main gate at the south end of the property on Ashbury Rd and the pedestrian gate to the east of the main gate are open. There are no locks. There are several places on the property where the fence has fallen down. One of these areas allows access for the many different animals that live there, such as the deer family that grazes on the land. Bobcats and raccoons can climb over the fence.

The 114 acres has the utility reclaimed water pipes for Rock Springs Rd. in Magnolia Springs subdivision. When a pipe broke last year, yards to the south of the 114 acres in Mandarin Lakes were flooding. When county workers turned off the water to fix the break, the yards dried up. Meanwhile, residents on Rock Springs Rd. had no reclaimed water for their sprinkler systems. If the property were sold, whoever buys it needs to know those reclaimed water pipes are in use and can't be removed without finding another way to supply reclaimed water to that street.

Access

Currently, the only access to the property is at the end of the Ashbury cul-de-sac in Devons Glen. This cement road is for county access for mowing and maintaining the RIBS. It is owned by the Devons Glen HOA. We are thankful that the teachers were allowed access this past year for research on the gopher tortoises. Blue Springs Rd. is a county platted road for an entrance off of Rock Springs Rd. Cutting a pathway through the trees and adding a large gate for maintenance vehicles with a small pedestrian gate would allow access for researchers and educators. We would prefer to leave the grassy lot there as it is now. Bicycles racks at the entrance would encourage people to bike there. Several other possible entrances have been identified if this project is allowed to go forward.

Revenue

The **highest and best use.** In looking at the appraisal document prior to the council's receiving bids for the 114 acres last year, that phrase really jumped out. Since that time, we have learned that it is a specifically defined phrase in real estate language. It seems to mean, in part, what will get the most monetary value from a particular property.

In that use of the phrase, we cannot argue that 200 houses would probably get the most money for the county, both in land sale and future revenues for taxes, but perhaps not as much as first thought.

Selling the land and putting in 200 houses looks only at that specific property. What it likely does not take into account is the decrease in property values and tax revenues of existing homes.

When we were here last year, we made a comment that our homes surrounding the property were sold with the promise that the 114 acres would not, could not, be developed. The response from members of the board was something to the effect of "realtors don't have the authority to make such promises." We understand that. The fact remains that current homeowners paid a premium for knowing the property would remain undeveloped. A response might be "caveat emptor," "buyer beware." Understood.

What is really at stake is not just those, relatively few, homes immediately surrounding the property, but homes as much as a half mile away. Studies have shown that property values decrease by a specific dollar amount the further away they are from a set-aside green space up to 3200 feet. That study was not done here, obviously, but the principle remains. Proximity to undeveloped, or minimally developed, purpose-driven greenspace of significant size adds value to nearby homes, thus increased revenue to the county.

The minimally accessible area in question might not produce the values of homes built there that some anticipated. People might not pay higher prices to live in an enclosure surrounded by existing communities. Certainly the immediately surrounding existing homes' values would drop. Thus the anticipated revenue growth would not be, overall, what has been portrayed.

A wildlife and STEM Education center such as we are describing could add value to existing homes. One study showed that in proximity to a significantly sized green space, "33 percent of the value of a plot of land 40 feet away, nine percent of the value when located 1000 feet away and 4.2 percent at a distance of 2500 feet" is tied to those distances. Those values turn into real dollars when assessed for tax purposes. Keeping the land relatively undeveloped is not the loss some might think it to be. Conversely "high use areas have a negative influence on adjacent property." In various parts of the country having "rail trail" property (trails established along former rail lines) adjacent to or near to housing areas increases values. In those surveys, 48, 61 even 87 percent of owners said their property values had increased. Another study showed that for homes "less than a half mile from a wildlife refuge…property values were 7 to 9 percent higher on average in the southeast."

Though it will not happen here because no outlay of funds is necessary, property tax revenues have paid for the expense of acquiring greenspace in other locations.

Palm Beach County, Florida, has rules which call for builders to preserve 1 ½ acres for every acre they develop. If Brevard County were to adopt such a rule, the 114 acres could be used as such a set-aside. Builders developing roughly 80 acres elsewhere could mitigate that land use by paying for this land as a set-aside.

While the technical definition of highest and best use might not be met unless the land was sold and houses built, that is a rather short-sided and limited view. A longer term outlook, more nuanced to unintended consequences, might give good reason to keeping this as a place to be minimally developed as a center for research, STEM and environmental education, and leisure/recreational use.

Such a center, we believe, would mesh very well with the recommendations given by Dan Martin of Market and Feasibility Advisors to the Brevard County Tourist Development Council as reported in the August 2, 2016, Florida Today. In part, he is reported to have said, "Invest more in nature tourism as a way to attract millennials to the Space Coast." Again, this property as a well-designed and used center can be such an attractive force. It could also become a tourist destination if done and used well.

In the same article, the TDC discussed using money from the tourist tax. We do not foresee asking the county for other future funding. We see this as a net gain for the county as we move forward.

We believe that such use, beyond mere dollars, is of much greater value to the county and its citizens. Such a center is the "highest and best use."

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http://green.blogs.nytimes.com/2012/05/30/wildlife-refuges-boost-property-values-study-shows/?_r=0

Possible Resources for Funding

The 2015 Brevard County Emergency Management Comprehensive Communication plan has the 114 acres listed as a possible location for a monopole of 120 ft. or a Slick Stick of 60 ft. cell tower

Through the nonprofit "The Friends of Hundred Acre Hollows," we plan to apply for grants from:

- The Wetland Reserve Program (WRP) which offers incentives and money for revegetating land with native plants.
- FWC for Gopher Tortoise management grants.
- Private land trusts
- The Gopher Tortoise Council which provides competitive educational grants every year for graduate students.
- Organizations that are seeking to preserve long leaf pine grants.
- The Arbor Day Foundation and Forest Service which offer free trees. Landowner assistance incentive funding is available.
- CPI grants from Florida
- Local businesses and corporations

Prepared by GREAT! Members:

Tom and Anita Unrath and Carl Rosskamp

Appendix 1

https://www.plt.org/educator-tips/top-ten-benefits-environmental-education/

TOP 10 BENEFITS OF ENVIRONMENTAL EDUCATION

Environmental education (EE) connects us to the world around us, teaching us about both natural and built environments. EE raises awareness of issues impacting the environment upon which we all depend, as well as actions we can take to improve and sustain it.

Whether we bring nature into the classroom, take students outside to learn, or find impromptu teachable moments on a nature walk with our families, EE has many benefits for youth, educators, schools, and communities.

As a longtime supporter of environmental education and as an Adjunct Professor of EE at University of Wisconsin – Stevens Point, it is my passion to inspire future educators in this field. Over the years, I have asked each of my classes to share the reasons they teach EE, what it means to them, and how it can benefit learners of all ages. Here are our top ten benefits of EE.

Top 10 Benefits of Environmental Education

1. **Imagination and enthusiasm are heightened**

   EE is hands-on, interactive learning that sparks the imagination and unlocks creativity. When EE is integrated into the curriculum, students are more enthusiastic and engaged in learning, which raises student achievement in core academic areas.

2. **Learning transcends the classroom**

   Not only does EE offer opportunities for experiential learning outside of the classroom, it enables students to make connections and apply their learning in the real world. EE helps learners see the interconnectedness of social, ecological, economic, cultural, and political issues.

3. **Critical and creative thinking skills are enhanced**

   EE encourages students to research, investigate how and why things happen, and make their own decisions about complex environmental issues. By developing and

enhancing critical and creative thinking skills, EE helps foster a new generation of informed consumers, workers, as well as policy or decision makers.

4. **Tolerance and understanding are supported**

   EE encourages students to investigate varying sides of issues to understand the full picture. It promotes tolerance of different points of view and different cultures.

5. **State and national learning standards are met for multiple subjects**

   By incorporating EE practices into the curriculum, teachers can integrate science, math, language arts, history, and more into one rich lesson or activity, and still satisfy numerous state and national academic standards in all subject areas. Taking a class outside or bringing nature indoors provides an excellent backdrop or context for interdisciplinary learning.

6. **Biophobia and nature deficit disorder decline**

   By exposing students to nature and allowing them to learn and play outside, EE fosters sensitivity, appreciation, and respect for the environment. It combats "nature deficit disorder" ... and it's FUN!

7. **Healthy lifestyles are encouraged**

   EE gets students outside and active, and helps address some of the health issues we are seeing in children today, such as obesity, attention deficit disorders, and depression. Good nutrition is often emphasized through EE and stress is reduced due to increased time spent in nature.

8. **Communities are strengthened**

   EE promotes a sense of place and connection through community involvement. When students decide to learn more or take action to improve their environment, they reach out to community experts, donors, volunteers, and local facilities to help bring the community together to understand and address environmental issues impacting their neighborhood.

9. **Responsible action is taken to better the environment**

   EE helps students understand how their decisions and actions affect the environment, builds knowledge and skills necessary to address complex environmental issues, as well as ways we can take action to keep our environment healthy and sustainable for the future. Service-learning programs offered by PLT and other EE organizations provide students and teachers with support through grants and other resources for action projects.

10. **Students and teachers are empowered**

    EE promotes active learning, citizenship, and student leadership. It empowers youth to share their voice and make a difference at their school and in their communities. EE helps teachers build their own environmental knowledge and teaching skills. I

hope these "top ten" benefits will give you the confidence and commitment to incorporate EE into your curriculum!

Appendix 2

Suntree 114 Acre Project ~ Thinking Sustainably for Brevard ~ July 2016

(Photo provided by Space Coast Eco Geeks) ***~An Invitation to Brevard County Residents~***

When a 114-acre parcel of surplus County land, wedged between multiple HOA communities, in north Suntree went up for sale last year, a group of Brevard residents organized a grass-roots initiative (Green Space **Environmental Advocates Task Force (GREAT!)) to seek an alternate "highest and best use"** for the land that would benefit all Brevard residents.

The historic Hernandez Trail was cut through this parcel of land in 1837, following an Ais Indian trail. In 1985, six basins were created to function as a water treatment facility. The property has returned to being a wildlife corridor with an estimated 300 gopher tortoises along with various other wildlife species.

According to **Sustainability**, **people need to make sure they don't use up the earth and its resources**, taking them from future generations. The urban-planning concept of **Placemaking** is an international movement where government, citizens, and businesses take open places and create a hub that enriches and connects all the people.

After interviewing several hundred residents throughout Brevard, the group found a consensus emerging: The land is far more valuable being sustained as a wildlife corridor, an open space to enhance the quality of life, an area for STEM education, and to connect the community.

In sum, after receiving myriad possibilities and suggestions for enhancing the quality of life for all Brevard residents, the group is proposing the following:

1. **Maintain the wildlife on-site** to sustain Florida's wildlife corridors and to preserve its ecotourism industry.
2. **Enhance quality of life** for people of all ages in an open, natural environment. Students of all levels engage in **STEM** (Science, Technology, Engineering, and Math) related activities in a non-traditional, outdoor setting to inspire future scientists, engineers, and well-rounded citizens. Create a hub where

people can connect with one another to promote civic engagement. Have various land uses and opportunities, including passive recreation, for health and well-being.

3. **Initiate a partnership among the public, private, and nonprofit sectors:** The County maintains ownership of the land, and the community partners with the County to maintain, operate, and provide required funding sources.

249 gopher tortoise burrows GPS tagged by the Eco Geeks

The **Space Coast Eco Geeks** deserve special thanks. They are four Brevard County biology teachers from four different high schools who have offered invaluable assistance to this project by studying and photographing the gopher tortoises and other wildlife on-site as part of their Eco Classroom project. For more information regarding their project- *which was graciously funded by Northrup Grumman*- see their website at: www.spacecoastecogeeks.blogspot.com

Future possibilities

There have been many suggestions for activities and improvements on the land such as a low maintenance trail system, land and aquatic demonstration gardens and exhibits, and small solar-powered, interpretive kiosks to further enhance the educational resources and quality of life for all Brevard residents. If **the group's proposals** are approved by the county, these suggested possible uses, among others, would be considered by the County on a case-by-case basis.

Statement of Support

I agree that the three proposed initiatives summarized above are the "highest and best use" of the 114 Acres in north Suntree, and I request that the Brevard County Board of Commissioners approve them.

By signing below, I acknowledge that I am 18 years or older, and I understand that the information provided may be submitted to the Brevard County Board of Commissioners in support of the Suntree 114-Acre Project.

Name (print)	Signature	City / State	Zip Code

Appendix 3

IFAS Community Development: The Importance of Local Community Action in Shaping Development 1

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1. This document is FCS 9209, of a series of the Department of Family, Youth and Community Sciences, UF/IFAS Extension. Original publication date
March 2005. Revised January 2014. Reviewed January 2014. Please visit the EDIS website at http://edis.ifas.ufl.edu
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This paper is part of a series of discussions on community development. This series will include specialized paperson civic engagement, community action, and other topics important to the development of community.

Introduction

The need for local participation and the organization of local residents to meet the challenges facing their communities are becoming increasingly important (Schachter and Yang, 2012). Extension professionals and policy-makers are more frequently faced with the task of establishing community programs in settings characterized by different needs, values, and policy preferences among groups of stakeholders. In many communities, these differences are often between groups seeking to protect community quality and sustainability, and those who seek to exploit local resources (especially the local workforce and natural resource base) as a means of achieving economic development. Equally common is the consistent transfer of responsibilities for services from government agencies to nonprofit community organizations. Such conditions have resulted in local residents and community organizations taking on greater roles in providing services and planning for future needs (Sharp, 2012). In response to the pressures and changes in such communities, activists, community-based nonprofit organizations, and coalitions of concerned community groups have emerged to shape and guide the development process. Similarly, organized local residents have played instrumental roles in identifying new development options in localities that historically were presented with few or no such options. Community-based action in these and other settings is seen as essential to community development and to the social and economic well-being of the locale. Often, there are no easy solutions to these issues where there is conflict with differing needs, values, and preferences. Often referred to as "wicked problems," these issues can be extremely complex where there may not be a final solution, but may be dependent on ensuring that all affected parties are involved in the discussions. These problems are not morally wicked, but are diabolical in that they resist the usual attempts to resolve them; the compromised solution often is relegated to whatever can best be done at the time (Rittel and Webber, 1973).

Community and the Action Process

The emergence of meaningful community development involves both interaction among residents and community action. Community action refers to the process of building social relationships in pursuit of common community interests and maintaining local life (Wilkinson, 1991). Community action is seen as being the foundation of the community-development process, because it encompasses deliberate and positive efforts designed to meet the general needs of all local residents. This process represents multiple and diverse interests in the locality, and consequently provides a more comprehensive approach to community development

(Wilkinson, 1991). Therefore, the action process is intended to benefit the entire community and to cut across diversity that may exist (class, race, ethnicity, etc.). In the overall process of community development, local residents' action focuses on the improvement of social well-being and involves people working together in pursuit of their general interests. This power is manifested in the ability of individuals to come together and work toward common community goals. When diverse individuals and their organizations interact with one another, they begin to mutually understand the needs and wants that are common to all residents (Wilkinson, 1991; Luloff and Swanson, 1995). Such action provides local residents with the ability to retain community identities, maintain local control over decision-making, and address their own issues and development needs. It is a central component of community and social well-being. The existence of community action directs attention to the fact that local people acting together often have the power to transform and change their community (Gaventa, 1980; Luloff and Swanson, 1995). Community action and corresponding development can be seen as the process of building relationships that increase the adaptive capacity of local people within a common territory. This adaptive capacity is reflected in the ability of people to manage, utilize, and enhance those resources available to them in addressing their local issues (Luloff, 1990; Wilkinson, 1991; Luloff and Swanson, 1995; Luloff and Bridger, 2003). As long as people care about each other and the place they live, every community has the potential for such collective action. This ability allows distinctions to be made between simple aggregates of people and actual communities.

The Community Action Process

To impact social well-being, community action must seek the development of the entire community, not simply the individual elements within it (Summers, 1986; Christenson and Robinson, 1989; Wilkinson, 1991). The community action process can be seen as containing far more than simple individual actions and efforts (Wilkinson, 1991). Most effective action efforts proceed through a series of steps that focus on solving specific problems and bringing residents closer together in the process. For community action to succeed, five sequential stages or steps can be identified: initiation, organization of sponsorship, goal setting, recruitment, and implementation (Wilkinson, 1970; Wilkinson, 1991):

1. The first stage, ***initiation***, focuses on promoting awareness of the issue related to the action. ***Initiation*** and spread of interest occurs when community members recognize and define an issue as being a problem or need, and they begin to discuss it as a potential focus for group action.
2. The second stage focuses on the ***organization of sponsorship***. This step addresses the structures, organizations, and resources available within and outside of the community. Such factors are important in relation to assessing community needs and the development of action efforts to address perceived problems.
3. The third stage is ***goal setting*** and strategy development. This stage develops targets for action and identifies strategies for achieving community-decided goals.
4. The fourth stage is ***recruitment*** and mobilization of needed resources including people, funds, and materials. Community members possess a variety of experience, skills, funding, materials, networks, and other resources vital to achieving desired community goals. Organizing and maximizing these resources significantly impact the success of community action efforts.
5. The final stage involves the application of these resources in the ***implementation*** of plans to achieve the desired goals. At this stage, specific actions are taken, assessed, adjusted, and implemented again.

Conclusion

Community action and the emergence of community should not be seen as representing romantic or idealized notions of local harmony and solidarity (Wilkinson, 1991; Luloff and Swanson, 1995; Luloff and Bridger, 2003). The truth is that focused and deliberate actions represent something far different. Action emerges out of interaction between diverse social groups, who often have clashing or at least distinctly different points of view. Interaction facilitates the coming together of such groups to assess their common and general needs. From this process, they form plans for action that benefit all stakeholders and ultimately the community in general. The importance of organizing diverse local residents to help shape community development cannot be overstated. By providing a comprehensive assessment of local conditions that represents all segments of the community, more efficient and successful programs can be developed. The input and guidance from local residents allow development to build upon the unique conditions and character of the community and allow local decision-making to remain in the locale. All of these create an environment where active local residents directly shape the community and its well-being.

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Civic Practices Network http://www.cpn.org/

The Community Development Society http://www.comm-dev.org/

Community Resource Group http://www.crg.org/

Community Tool Box http://ctb.ku.edu/

International Association for Community Development http://www.iacdglobal.org/