

Matthew A. Noble
ANoblePlan, LLC
anobleplan@gmail.com
(239)898-5182

February 19, 2015

Brandon Dunn
Principal Planner
Lee County Division of Planning
1500 Monroe Street
Fort Myers, FL. 33902

RE: CPA20015-00001 Corkscrew Farms Insufficiency Letter Response

Dear Brandon:

Please find attached Kevin's revised Corkscrew Farms Restoration Strategy. Also please find attached a letter from Estero Fire Rescue stating that the previously requested concurrency analysis is no longer required. I trust that you now have everything you need to find this application sufficient for review.

Thank you for your attention in this matter. Please do not hesitate to contact me if you need any additional information. We are looking forward to the LPA hearing in March.

Sincerely,



Matthew A. Noble

COMMUNITY DEVELOPMENT

Corkscrew Farms Restoration Strategy

Kevin L. Erwin CE PWS
Kevin L. Erwin Consulting Ecologist, Inc.

February 18, 2015

RECEIVED
FEB 19 2015

COMMUNITY DEVELOPMENT

Vision

To restore a key ecological feature within the DRGR by returning approximately 700 acres of Corkscrew Farms' over-drained agricultural lands back to productive, fully functioning and sustainable wetland habitats.

Measurable Restoration Goals

- Preserve all existing native wetlands onsite.
- Restore the historic flow ways on site.
- Restore and create historic hydric pine, cypress and marsh wetland habitats in existing agricultural land.
- Increase wildlife utilization by listed species, especially the wood stork.
- Increase biological diversity of wildlife onsite.
- Increase species richness of native vegetation communities.
- Open the existing berm along the project's north boundary to reestablish historic sheet flow from the north.
- Control surface water at an elevation determined to reestablish the surficial ground water profile in terms of both elevation and duration.
- Reestablish the historic groundwater profile.
- Improve hydrological conditions on adjacent public conservation lands.
- Reconnect wildlife corridors to adjacent public lands
- Remove all exotic and nuisance vegetation from the existing native wetlands and uplands.
- Significantly improve existing water quality conditions.

- Improvement to the current high water elevations seasonally experienced in the Burgundy Farm Subdivision.
- The restoration will limit the discharge of surface water to the Flint Pen Strand to predevelopment flows.

Introduction

The Farms occupies a strategic location in the DRGR immediately adjacent to the Airport Mitigation Park to the north and the Corkscrew Regional Mitigation Bank (CRMB) to the east. Kevin Erwin Consulting Ecologist, Inc. (KECE) has designed and implemented the successful restoration of the CRMB (SFWMD) and Imperial Marsh Preserve (Lee County 20/20) projects east of and adjacent to the Corkscrew Farms site.

The Farms property slopes from a high elevation of 28.0' in the northeast corner to 19.0' in the southwest corner. This significant drop in elevation along with the existing network of agricultural drainage canals and ditches creates an adverse impact to the hydrology of the site as well as the public conservation lands to the east and north by draining those properties. All surface water currently flows into Flint Pen Strand to the west via the Corkscrew Road drainage ditches.

Ground and surface waters that historically pooled on this site during the wet season are now quickly drained directly into the Corkscrew Road drainage ditches that parallel the roadway along the southern boundary of the site. The property is currently subject to agricultural uses including sod farming, row cropping and improved pasture. An agricultural berm extending along the north property line intercepts wet season sheet flow moving south from the Airport Mitigation Park and drains west into the vicinity of the Burgundy Farms subdivision which lies west of and adjacent to the site.

Summary of benefits resulting from the restoration

- Restoration of nearly 700 acres of historic wetlands at no cost to the public.
- Historic water levels and hydroperiods will be restored.
- Restoration will reestablish the historic groundwater profile.
- Restoration will improve hydrological conditions on thousands of acres of adjacent public lands to the north and east.
- Historic flow ways will be restored across the site.

- Water quality will significantly improve onsite
- Improved water quality and groundwater levels will benefit the adjacent Lee County Utilities well field.
- Surface water discharge to the Flint Pen Strand will be limited to predevelopment flows.
- Opening the northern berm to southerly surface flow will improve the current high water elevations seasonally experienced in the Burgundy Farm Subdivision.
- Wildlife utilization and species diversity onsite will significantly increase.
- The incorporation of this form of restoration with residential development will set a new, high standard for future development in Lee County.

Designing the Corkscrew Farms Restoration Plan

Ecological History

Work began when KECE conducted an ecological history of the site and surrounding lands to determine the predevelopment ecological and hydrological conditions. KECE relied in part on the DRGR study that the firm completed for Lee County in 2008. It was this study that identified the property as a Tier 1 Priority Restoration Site. 1953 aerial photographs (Figure 1 shows the subject property) from the Soil Conservation Service (now the National Resource Conservation Service), which were the clearest reliable representation of historic conditions, were scanned and plotted for mapping by KECE to determine the approximate historic hydrological conditions for the entire study area.

The major habitat associations identified relate to specific hydroperiod and water depth conditions (hydropatterns), with each being color-coded to illustrate the historical hydropatterns in the DR/GR (Figure 2 shows the subject property).

KECE found that during a significant part of any year with normal rainfall much of the DR/GR, including the Farms, had historically been flooded or had groundwater levels close to the surface. The deeper ponds, cypress swamps, and marshes have been assigned dark blue with progressively shallower, shorter hydroperiod (shorter duration of inundation) wetlands being assigned lighter shades of blue (Figure 2). This representation illustrates the location of historic flow ways and headwater sheet flow areas and allows us to roughly calculate the historic capacity for water storage during an annual cycle.

Figure 1.

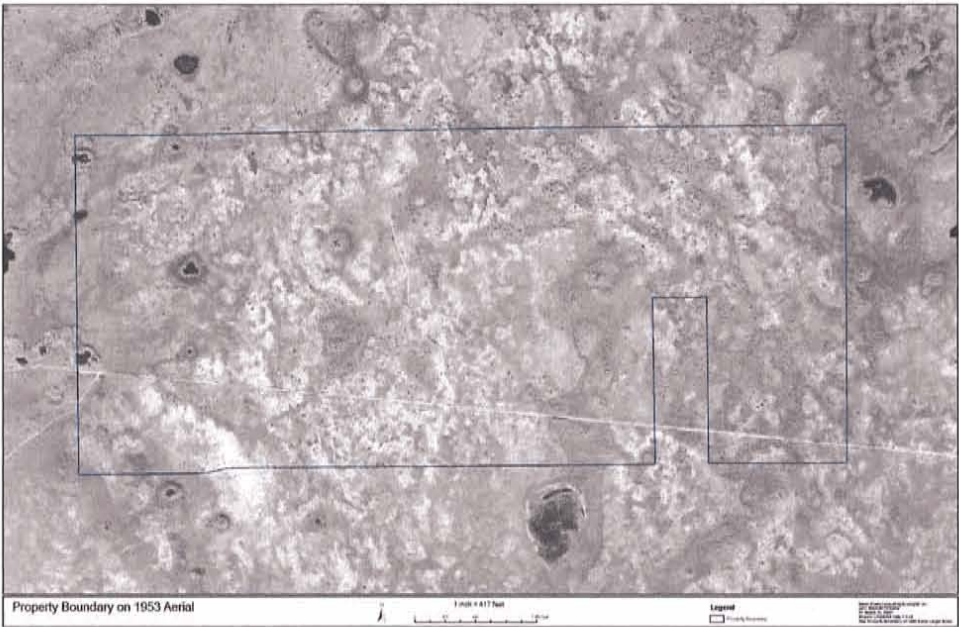
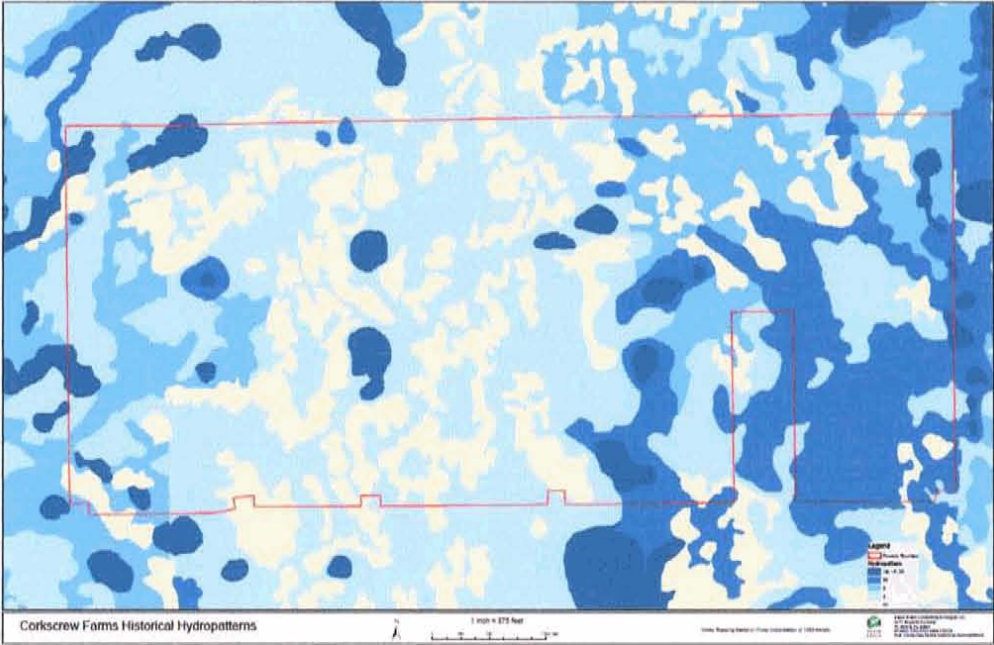


Figure 2.



Existing conditions

With the long-term goal of creating a plan to restore wetlands by reversing manmade site drainage, the first year objective is obtaining data to support engineering and construction plans based on hydrologic models and flora and fauna sampling locations for the sites. The models require information on the current onsite and offsite conditions to be determined by previous studies, baseline hydrology and wildlife information, which requires data collection. Data collection and analysis will be undertaken by KECE and Barraco.

In June of 2014 we installed shallow groundwater monitoring wells and rain gauges across the site to collect existing conditions hydrological data. This data along with the inflow and out flow calculations provided by the project engineer (Barraco) will provide the information required to determine the approximate amount of water that remains available to "rehydrate" the drained farm fields. Similar data, if available, will be requested from the public mitigation lands located to the north and east of the Farms.

Available topographic data (Lee County LiDAR) will be field verified and used by Barraco and KECE to estimate future wet season water levels and hydroperiods on the site given various restoration scenarios we evaluate.

Planning

Each scenario evaluated by Barraco and KECE will involve different combinations of ditches, ditch plugging and risers (water control structures) to "back-up" the water in cascading stages across the site from northeast to southwest. The scenario that best retains water onsite in manageable basins and mimics the historical hydropatterns, by raising the groundwater levels, increasing hydroperiods and restoring the historic flow ways, will be used as the basis for the restoration plan. Surface water will once again be allowed to sheet flow into the site from the lands north and east of the Farms at selected locations where it is now blocked by berms and currently re-directed by farm ditches and canals.

The restoration targets (appropriate vegetation community types for the expected post-restoration hydrological conditions), will be the same as those selected and now doing very well at the CRMB. The restored farm fields will contain a mixture of very shallow (0 to 3" depth) hydric pine forest, slightly deeper shallow cypress and marsh (3" to 12". Unfilled, ditch segments (within basins/no positive outfall) will be re-contoured to become deep marshes and ponds which will provide wood storks with the early nesting season (November-December) foraging habitat that is now rare in this area. National Audubon Society research suggests that wood stork nesting declines in this region are linked to loss of shallow wetlands.

There are a few, drained cypress and hydric pine wetlands remaining on the site. These areas are heavily infested with problematic exotic plant species. They will first be cleaned of all exotics then rehydrated as part of the overall restoration plan.

In order to manage and convey surface water on the site several flow ways will be constructed as part of the restoration plan. These flow ways will be located in the vicinity of the historical flow ways. The constructed flow ways design resembles natural sloughs with wide floodplains. Flow way water levels will be maintained by water control structures, thus allowing water to be stored upstream of the structure and allowing storm flows to pass over or through the structure. A major water control structure will be located at the southwest corner of the site where all surface waters will eventually collect and discharge into the Corkscrew Road ditch and eventually into Flint Pen Strand to the west.

When completed the design and phasing of the restoration plan will resemble the restoration plan KECE developed for the CRMB (Figure 3).

Figure 3.



Offsite Benefits

Historically, a high groundwater table and shallow surface water flowed slowly from the northeast to the southwest. When the Farms agricultural drainage system is replaced by restored wetlands and flow ways the elevated groundwater table will reduce the drainage and extend the hydroperiods of the wetlands within the adjacent Airport Mitigation Park and the CRMB. Seasonal high water levels in the Farms restored wetlands will be managed to match the preferred water levels on the adjacent public lands. The adjacent lands will not experience an increase or decrease in seasonal high water levels however; a restoration of normal hydroperiods (based on normal rainfall) will result.

Prior to the restoration of the CRMB and the Imperial Marsh Preserve the uncontrolled drainage of the lands along the north side of Corkscrew Road quickly drained these properties as well as the adjacent public lands (Airport Mitigation Park) to the north. As the CRMB hydrology was restored followed by the Imperial Marsh Preserve restoration the regional hydrology improved with less water being drained south into the Corkscrew Road ditch. The Farms wetland restoration will complete the last section of restoration of the agricultural drainage system, thus improving hydrological conditions to the north and east while also benefiting the Burgundy Farms subdivision to the west.

No adverse impacts to adjacent public lands or private properties will result from the planned residential development and wetland restoration only a net improvement in conditions.

Expected benefits to wildlife

The restoration of native upland pine forest, cypress and hydric pine wetlands and large expanses of pasture will result in significant benefits to wildlife. These restored habitats are large and will be connected to similarly restored public lands to the north and east thus reestablishing wildlife corridors for species such as panthers and bears.

In normal rainfall years, restored hydric pine, cypress and marsh habitats with extended hydroperiods will provide foraging and nesting habitats for many wetland dependent species including woodstorks and other wading birds. Large numbers of woodstorks will forage in the restored wetlands and particularly the deeper pools created from the enhanced ditch segments and berm removal areas.

There will be no adverse impacts to upland or wetland forests as a result of the restoration or residential development. These forested areas, now infested with exotic and nuisance species of vegetation, will be enhanced through exotic control thus significantly improving potential habitat for species like the fox squirrel, indigo snake, bonneted bat.

Existing farm operations that minimize the site's utilization by species like burrowing owls and Caracara will be discontinued. Row cropping and sod farming will be replaced with restored habitats and land management techniques more conducive to successful nesting and breeding of these and other wildlife species..

KECE's monitoring of similar restoration projects, like CRMB and Little Pine Island, has shown significant increases in biological diversity from the baseline to the restored condition. Many resident and migratory species of birds, reptiles and mammals not currently utilizing the site will quickly be attracted to the restored conditions. Wildlife diversity and density will be recorded by KECE at selected times throughout the wet and dry season to measure changes in ecological values. Changes in vegetative cover will also be periodically summarized by KECE. These data will be essential to gauge the success of the restoration effort and any adaptive management required.

Shallow wetlands of the type that once dominated the Corkscrew area are a priority habitat for wood storks, wading birds and other wetland dependent species. These wetlands contain, and during seasonal dry periods concentrate, the small forage fish nesting wood storks and their chicks need. The most important wood stork nesting site is at Audubon Corkscrew Swamp Sanctuary. From that site storks forage in a radius of approximately 30 kilometers, which is referenced as the core foraging area. Audubon's research indicates the loss of more than 82% of the historic extent of shallow wetlands in the form of wet prairies within the core foraging area. This loss of wetlands is thought to be the most significant factor in regional wood stork decline in the Corkscrew watershed and other parts of the Western Everglades.

Audubon's wood stork colony located within the Corkscrew Swamp Sanctuary boasts the historically largest and arguably most important individual wood stork colony in the United States. Despite this status, the colony also holds the dubious distinction of being among the least stable within its US breeding range. Wood storks are a keystone indicator species for the health of southwest Florida's wetlands and are one of 13 indicator species for Everglades restoration listed by the South Florida Ecosystem Restoration Task Force. The SFWMD and Army Corps of Engineers (ACOE) use wood stork distribution and abundance as an indicator of restoration progress and success.

In addition to the significant wood stork benefits the Corkscrew Farms restoration project will provide, there will be ecological lift to many species that are dependent on shallow wetlands for portions of their life cycles, including a number of other listed species. The restoration will benefit wading birds such as tri-colored herons, little blue herons, white ibis, roseate spoonbills, glossy ibis and snowy egrets as well as mammals such as panthers, black bears and fox squirrels. Migratory and resident birds will also benefit along with the community of aquatic fauna (fish, invertebrates, reptiles and amphibians) that will occupy the restored wetlands. KECE ecologists expect to see the

prey base (fish and invertebrates) increase and concentrate early in the nesting season attracting foraging storks and other wading birds. Other increases should include mammal traffic and diversity of other wildlife as the water levels rebound to near historic patterns and native plant communities become established.

Implementing the restoration plan

The construction of the Farms wetland restoration will be supervised by the project ecologist, Kevin L. Erwin Consulting Ecologist, Inc. The firm has designed and managed the construction and maintenance of more than 100 restoration projects over the past 35 years, many within Lee County such as; CRMB, Imperial Marsh Preserve, Prairie Pines Preserve, Gateway; Six Mile Cypress Preserve North, Western Cape Coral/Matlacha Pass, Florida Gulf Coast University and the Little Pine Island Wetland Mitigation Bank. This experience is a key element of the successful implementation of the Farms restoration plan.

Phasing

The construction activity will be phased according to the activity and season following the schedule of residential development. Initial activity will focus on removing exotic vegetation of all proposed restoration and enhancement areas (pastures and native habitats). Preparation of fields will be accomplished in phases, basin by basin, commencing at the upstream end of the system. Water levels will be restored in a basin only when all other restoration activities are finished in that basin.

Restoration Actions

Restoration in each basin will include a combination of the following activities. Detailed time-lines will be prepared prior to construction and used to manage all planned activities.

- 1. Exotic vegetation removal from natural areas.** All natural wetland and upland areas will be cleaned of exotics and nuisance species prior to any hydrological restoration. This enhancement activity typically involves foliar treatments of approved herbicides on herbaceous species and basal applications to trees such as Schinus and Melaleuca.
- 2. Prescribed burning.** Fire is an important tool for maintaining the upland habitats following exotic removal and may also be used to prepare the pasture areas for restoration.
- 3. Wildlife mitigation.** Wildlife permitting will likely require management protocols for the listed species onsite, such as burrowing owls, to provide protection and enhancement during the restoration activities. All residential development related

panther and woodstork impacts will be offset through the purchase of mitigation bank credits.

4. Removing perimeter ditch berms to natural grade. The berm along the north perimeter of the site will be opened to provide a reconnection of the flow ways offsite and through the restored sections of the Farms. Openings will be located to minimize disturbance to mature trees such as pines and oaks that are now established on sections of the berm

5. Removing farm field ditch berms and backfilling ditch segments. Sections of ditches will be backfilled using the adjacent berms which will be removed to an elevation equal to or less than natural grade. This action eliminates any drainage function and will provide additional wading bird habitat and biological reservoirs for forage species.

6. Raising the groundwater table. This action will involve manipulating the water control structures to enable an evaluation of seedbank response and natural recruitment.

7. Herbiciding and tilling farm fields for seed bank enhancement. This alternating process of herbiciding followed by tilling will control exotics and nuisance plant species while stimulating the natural recruitment of desirable native species from the seed bank.

8. Planting and direct seeding tree, shrub and herbaceous species. A combination of planting or direct seeding may be done within those areas of the restoration site where natural recruitment from the seedbank is lacking. Activities such as row cropping and sod production often impact the seedbank found in the shallow O and A-horizons of the soil. Bare-root seedlings of trees and shrubs, such as slash pine and cypress, will be selectively planted to enhance the process of farm field restoration. Some localized bare-root plantings or direct seeding may be used to enhance the areas where berms have been removed and ditches re-shaped as well as flow way construction.

Enhanced tree plantings may be incorporated along the borders of the residential development footprint to improve the aesthetic appeal of the early stages of restoration. These plantings would be within a 50 ft. wide zone of the restoration area, adjacent to all development (back of lots), and would be planted on 20 ft. centers with shrubs planted on alternating 20' centers subject to review and approval by Lee County and the Florida Fish and Wildlife Conservation Commission.

9. Construction of flow ways and installation of water control structures. These ecological engineering design components will be constructed and installed as each phase as the restoration progresses in a basin by basin sequence. The water control structures utilized will vary from culvert risers to concrete weirs, very similar to the CRMB and Imperial Marsh restoration projects.

The culvert risers will allow the project ecologist to adaptively manage the water levels in each basin. Having this capacity to manage the water levels this way is important, especially during the first few years of a forested wetland restoration project. The concrete weirs will control water levels over larger areas of the site particularly within the flow ways which will be collecting surface water and like a natural slough, will provide direction to the surface water sheet flow onsite.

The constructed flow ways will vary in width from 50 to 150 ft. width with an excavated cross-section that resembles a natural slough complete with a deeper, meandering stream channel. The broad and shallow side-slopes planted with wetland species will be flooded as wet season water levels rise behind the water control structures. As the wet season ends, water levels will slowly recede back into the stream channel providing forage opportunities for wading birds like the wood stork.

9. Construction monitoring and adaptive management of the restoration. All of the restoration activities will be monitored by the project ecologist to provide guidance on the continuing restoration work and also information to agencies as required.

The following photos of similar restoration activities were taken at the CRMB.



Removing invasive exotic vegetation (2003)



Pasture before restoration (2004)



Disking former agricultural fields in early stages of restoration (2004)



Using prescribed fire as a management tool (2005)



Seeding hydric pine flatwoods pasture restoration area (2005)



Planting bare root pine tree seedlings in restored hydric pine habitat (2007)



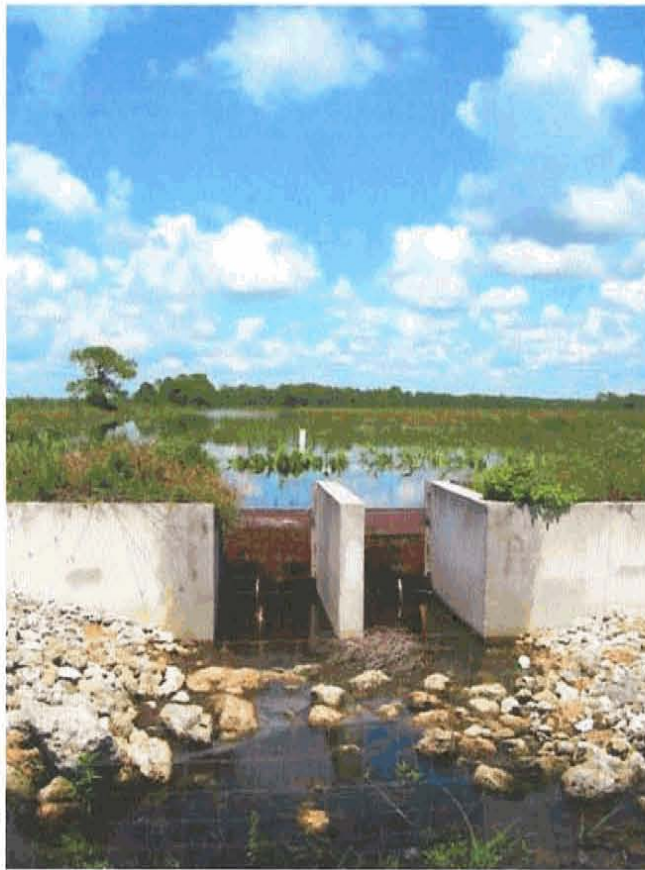
Hydric pine restoration area (2008)



Backfilling agricultural ditches (2008)



Backfilled and graded ditches to become hydric pine flatwoods (2008)



Main control structure, adjacent to the Farms, on Corkscrew Road (2009)



Releasing water to maintain appropriate water levels (2009)



Breaching existing berm to restore sheet flow (2008)



Restored sheet flow through breached berm (2008)



Created freshwater marsh (2008)



Monitoring restoration results (2009)



Mixed flock of wading birds (2009)

Long-term monitoring and management of the restoration areas.

The proposed design of the Corkscrew Farms wetland restoration focuses on outcomes and restoration targets that will be sustainable for many years with the guidance of an appropriate long-term management plan which will be developed and adopted.

A key to successful, cost-effective, long-term management will be the adoption of a long-term monitoring plan in the restoration area. A long-term monitoring plan will provide ecological data such as water levels, vegetative cover and wildlife utilization. This information will guide the adaptive management of the site.

The restoration areas will be identified as conservation areas as the project is approved and will be placed in conservation easements. The conservation easements will prevent the encroachment of future development as well as activities that are incompatible with the goal of sustaining the restored conservation areas in good ecological health. These areas will be physically managed following the long-term management plan prepared by the project ecologist, implemented by the Home Owners Association with the assistance of an appropriately skilled environmental professional.

Long term management activities required within the restored conservation areas will include periodic surveys of vegetation and wildlife within the restoration area, control of exotic and nuisance plant species, regulating water levels, maintenance of the water control structures and access.



Estero Fire Rescue
21500 Three Oaks Parkway
Estero, Florida 33928
(239) 390.8000
(239) 390.8020 (Fax)
www.esterofire.org

February 18, 2015

Mr. Brandon Dunn
Principal Planner
Lee County Community Development Services
1500 Monroe Street
Fort Myers, Florida

Re: Corkscrew Farms

Mr. Dunn,

Estero Fire Rescue will no longer require a Fire Department Service Delivery Concurrency Evaluation for the project known as Corkscrew Farms based on the following mitigation efforts by the applicant Joseph Camerata;

1. 5 acres of the site property along Corkscrew Road will be deeded to Estero Fire Rescue for the location of a future fire station upon the closing of the property by Mr. Camerata.
2. A check in the amount of \$17,000 shall be forwarded to Estero Fire Rescue for the purpose of Radio System Enhancement also at the time of closing by Mr. Camerata.

If I may be of any further help with this project please feel free to contact at 239-390-8000.

Sincerely,

Phillip Green
Division Chief of Prevention

CC Joseph Camerata

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