DATA AND ANALYSIS
CONSERVATION AND COASTAL MANAGEMENT ELEMENT

for

The Village of ESTERO

COMPREHENSIVE PLAN

LaRue Planning & Management Services, Inc.
SOILS

The Soils Map for the Village of Estero was developed using data provided by USDA / NRCS through the Florida Geographic Data Library published in 1994.

According to the USDA/Soil Conservation Service Soil Survey of Lee County, Hydric soils (cross hatch pattern on the Soils Map) are those soils that, in their natural conditions, are saturated, flooded, or ponded long enough during the growing season (February-December in Lee County) to develop anaerobic conditions that favor the growth and regeneration of hydrophytic (wetland) vegetation. Areas containing hydric soils may require additional review prior to development to assess the presence of jurisdictional wetlands and potential permitting with the State and / or US Army Corps of Engineers prior to local development approval.

WATER RESOURCES

The Village of Estero includes a variety of water resources ranging from project level storm water management systems to Estero Bay including the drainage-ways, ditches, canals, tributaries and rivers that connect them. Many of these resources hold special state level status as discussed below:

Estero Bay Aquatic Preserve

The entire western border of the Village of Estero abuts the Estero Bay Aquatic Preserve (EBAP). This was the first Aquatic Preserve designated by FDEP in 1966. The EBAP is a shallow estuary covering approximately 11,000 acres of sovereign submerged lands fed by five minor freshwater tributaries including the Estero River, Halfway Creek, and Mullock Creek within the Village of Estero. Several diverse environments including seagrass beds, mangrove islands, salt marshes, tidal flats, oyster bars and passes provide habitat to numerous protected fish, reptile, bird, and mammal species. The EBAP is used heavily for boating, kayaking, fishing and more, and includes the Estero Bay and River Paddling Trail and portions of the Great Calusa Blueway.

Outstanding Florida Waters

Section 403.061(27) Florida Statutes, grants FDEP the power to establish rules that provide for a special category of waterbodies within the state to be referred to as “Outstanding Florida Waters,” (OFW) which shall be worthy of special protection because of their natural attributes. Estero Bay and its tributaries including portions of the Estero River, Halfway Creek, and
Mullock Creek have been designated by FDEP as OFWs (See Water Resources Map).

Projects regulated by FDEP or a Water Management District (WMD) that are proposed within an OFW must not lower existing ambient water quality, which is defined for purposes of an OFW designation as the water quality at the time of OFW designation or the year before applying for a permit, whichever water quality is better. In general, the State cannot issue permits for direct discharges to OFWs that would lower ambient (existing) water quality. In most cases, this deters new wastewater discharges directly into an OFW, and requires increased treatment for stormwater discharging directly into an OFW. The State also may not issue permits for indirect discharges that would significantly degrade a nearby waterbody designated as an OFW.

Development within the Village of Estero that may potentially impact OFW may be subject to increased review by local permitting agencies during comp plan amendments, zoning, and / or landuse changes.

In addition, activities or discharges within an OFW, or which significantly degrade an OFW, must meet a more stringent public interest test during permitting. The activity or discharge must be “clearly in the public interest.” For example, activities requiring an Environmental Resource Permit (ERP), such as dredging or filling within a wetland or other surface water or construction/operation of a stormwater system, must be clearly in the public interest instead of not contrary to the public interest.

EXISTING COASTAL USES

The Village of Estero borders the Estero Bay Aquatic Preserve and its western edge includes portions of the Estero Bay Preserve State Park. As such, existing coastal uses are comprised of boating, fishing, and paddling, along with passive recreational uses such as hiking, bicycling, and wildlife viewing.

There are four known boat ramps within the Village of Estero, all located along the Estero River. Additionally, portions of the Great Calusa Blueway paddling trail circle Estero Bay and continue up the Estero River to US 41.

EXISTING VEGETATIVE COMMUNITIES

Generalized land cover data for the Village of Estero is provided on the Existing Vegetative Communities Map. This map was prepared using data from the South Florida Water Management District from their 2008-2009 land use / land cover data set. It is important to note that land cover presented here are
derived from aerial interpretation, soils maps, and local knowledge, but have not been field verified. Additionally, recent developments within areas designated as agriculture, rangeland, and upland forest have reduced these areas, as may be evident on an aerial overlay.

The Coastal Planning Area as depicted on the Existing Vegetative Communities Map is defined in the Lee Plan and offers additional protection to wetlands and uplands defined as Rare and Unique that are located within the Coastal Planning Area. Further discussion on Rare and Unique uplands is provided below.

**PROTECTED SPECIES**

The Village of Estero provides habitat for several State and federally listed invertebrate, fish, amphibian, reptile, bird, mammal, and plant species. Lists of species that are endangered, threatened, and of special concern are maintained by the Florida Fish and Wildlife Conservation Commission (FWC) (available at [http://myfwc.com/media/1515251/threatened-endangered-species.pdf](http://myfwc.com/media/1515251/threatened-endangered-species.pdf)) and the U.S. Fish and Wildlife Service (FWS) (available at [http://ecos.fws.gov/ecp/](http://ecos.fws.gov/ecp/)).

The Protected Species Map (Map 3e5b2) provides generalized suitable habitat information for several listed species as discussed below:

**Florida Panther**

The Florida panther (*Puma concolor coryi*) is a large, wide ranging cat in the cougar family that lives in forests and swamps of southern Florida. As shown on the Protected Species Map, much of the Village of Estero lying east of I-75 is within the Primary Panther Zone as designated by FWS. Additionally, panther telemetry and road kills have been recorded within the boundaries of the Village as shown. Projects within the Primary Panther Zone typically require review in accordance the Florida Panther Recovery Plan ([https://www.fws.gov/verobeach/MammalsPDFs/FinalizedFloridaPantherRecoveryPlan081218.pdf](https://www.fws.gov/verobeach/MammalsPDFs/FinalizedFloridaPantherRecoveryPlan081218.pdf)) through consultation with FWS during the wetland permitting process, and likely require some form of compensatory mitigation for impacts to panther habitat.

**Black Bear**

The Florida black bear (*Ursus americanus floridanus*) has seen increases in population over the past few decades and there are likely more black bears in Florida now than there have been in the past 100 years. For that
reason, the black bear was recently delisted by FWC. As the Protected Species Map indicates, several black bear sightings and road kills have been observed throughout the Village boundary, especially east of I-75. FWC has developed the BearWise program aimed at reducing human–black bear conflicts. Information regarding the BearWise program can be found on the FWC website and may provide a valuable tool for future developments in territory inhabited by black bears.

(http://myfwc.com/wildlifehabitats/managed/bear/wise/).

Florida Bonneted Bat

The Florida bonneted bat (Eumops floridanus) (FBB) was listed as endangered by FWS in 2013. FBB are known to utilize various forested and open habitats along with manmade habitats such as golf courses and lakes. Very little information regarding the life history, roosting and breeding behavior of the FBB is available at this time. However, the FWS has designated both a Consultation Area and a Focal Area for the FBB. The entire Village of Estero is within the FBB Consultation Area, but no portion of the Village lies within the FBB Focal Area. Information regarding the FBB is available from FWC at (http://myfwc.com/wildlifehabitats/imperiled/profiles/mammals/florida-bonneted-bat/).

Red Cockaded Woodpecker

The red-cockaded woodpecker (Picoides borealis) (RCW) is listed as endangered by FWS. The RCW makes its home in mature pine forests. RCWs are the only woodpecker to excavate cavities exclusively in live pine trees. FWS adopted the Red-Cockaded Woodpecker Recovery Plan and designated an RCW Consultation Area, which covers the eastern portion of the Village of Estero (See Protected Species Map). Information regarding RCW is available from the FWS website (https://www.fws.gov/rcwrecovery/rcw.html). Future development within the Village of Estero that contain stands of mature pine trees may require further review to determine the potential use of the site by RCW.

Bald Eagle

The southern bald eagle (Haliaeetus leucocephalus) was delisted by FWS in 2007. However, it is still protected under the Bald and Golden Eagle Protection Act. Bald eagles and their nests are protected from being disturbed or taken, and additional protection is offered via a buffer around the nest site that limits or precludes development up to a 660 feet from the
nest. The FWC offers a bald eagle nest locator service (https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx) for the location of known bald eagle nests. Any development within 660 feet of a bald eagle nest may require a management plan in accordance with the Bald Eagle Management Plan published by FWC and may require additional review.

**Wood Stork**

The wood stork (*Mycteria americana*) is a large social wading bird classified as endangered by FWS. Wood Storks feed on small fish in wetlands, ponds and ditches and are particularly attracted to depressions in marshes or swamps where receding water traps and concentrates small fish. Large protected nesting colonies have been designated by FWS for protection along with a core foraging area that extends 18.6 miles from the colony. Although no wood stork colonies are located within the Village of Estero boundary, the entire Village is within the core foraging area of either the Corkscrew (Atlas Number 619018) or Caloosahatchee River (Atlas Number 619040) colonies. Developments impacting wetlands within a core foraging area may be required to provide compensatory mitigation for loss of foraging habitat.

**Smalltooth Sawfish**

The smalltooth sawfish (*Pristis pectinata*) is a relative of sharks, rays and skates and lives in shallow tropical waters of the Gulf of Mexico. The smalltooth sawfish bears live pups in shallow brackish water often using the prop roots of red mangroves as nursery areas. FWS listed the smalltooth sawfish is listed as endangered and designated areas of Critical Habitat for the species. All of the Estero Bay is included as Critical Habitat for the smalltooth sawfish. Any development that impacts mangroves or shallow areas of Estero Bay will likely require review by the National Marine Fisheries Society.

**Seagrass**

Seagrasses are flowering plants that live completely submerged in marine and estuarine waters. Seven species of seagrasses can be found in Florida waters including turtle grass (*Thalassia testudinum*), shoal grass (*Halodule wrightii*), Manatee grass (*Syringodium filiforme*), Widgeon grass (*Ruppia maritima*), Stargrass (*Halophila engelmannii*), Paddle-grass (*Halophila decipiens*) and Johnson's seagrass (*Halophila johnsonii*). The depth at which seagrasses occur is limited by water clarity because most species require high levels of light. The Protected Species Map includes existing
areas seagrass beds in Estero Bay mapped by FDEP. Development of docks, marinas, channels, bridges or other uses that impact seagrasses are reviewed by FDEP and may require compensatory mitigation.

**RARE AND UNIQUE UPLANDS**

Goal 104 (Coastal Resource Protection) of the Lee Plan is to protect the natural resources of the Coastal Planning Area from damage caused by inappropriate development. The Coastal Planning Area is defined as:

*The coastal study area of the 1988 Lee County Coastal Study which is defined as all sections of unincorporated Lee County containing any portion of the 1988 A Zone (the 100-year floodplain as mapped in 1988 by FEMA), lying westward of the municipal boundaries of Fort Myers and Cape Coral.*

For the Village of Estero, this includes 14 sections comprised of Sections 25, 28 – 33, and 36 of Township 46 South, 25 East, along with Sections 4 – 9 of Township 47 South, 25 East.

Within the coastal planning area, the county currently manages and regulates, environmentally critical areas to conserve and enhance their natural functions. Environmentally critical areas include wetlands and Rare and Unique (R&U) upland habitats. R&U upland habitats are high-quality native upland habitats, that include but are not limited to: sand scrub; coastal scrub; those pine flatwoods which can be categorized as "mature" due to the absence of severe impacts caused by logging, drainage, and exotic infestation; slash pine/midstory oak; tropical hardwood; live oak hammock; and cabbage palm hammock.

The Rare and Unique Uplands Map depicts the location of the Coastal Planning Area along with potential R&U uplands as mapped by the South Florida Water Management District Land Use / Land Cover data set (2008 – 2009). It is important to note that the depiction of R&U uplands is based on aerial photograph interpretation, therefore some areas of R&U uplands that merit preservation may not be shown on the map. Additionally, some areas that are mapped as R&U uplands may not qualify due to past development, logging, drainage, and exotic infestation. Finally, some of the R&U uplands shown on the map are located within State, County, or private preserve areas.
COMMERCIALLY VALUABLE MINERALS

Florida Geological Survey (FGS) Map Series No. 130, depicting the mineral resources of Lee County, was used to determine the sources of commercially valuable minerals within the Village of Estero. According to the FGS, the principal economic mineral commodities in Lee County are limestone and sand. The units depicted on the FGS map are intended to present a geographic overview of the mineral commodities, and Map Series No. 130 states, “Factors such as thickness of overburden, quality, and volume of deposit could affect the mining of the mineral commodity at any specific site.” Areas shown as potentially commercially valuable with respect to limestone and undifferentiated resources (clayey, shelly sand, clay) occur within the boundary of the Village of Estero. Areas of potentially commercially valuable limestone are depicted in the eastern part of the Village, while undifferentiated resources occur in the west.

In Map Series No. 130, FGS states the extraction of limestone dominates the mining industry of Lee County. Although the map was created originally around 1990, that statement likely remains valid today. Most of the limestone mined comes from the Tamiami formation, and is extracted via open pit mining. The mined limestone is generally used for base material in roadway construction, as aggregate-grade rock for concrete and asphalt, and as riprap and drainfield aggregate. Undifferentiated resources composed of clayey, shelly sand, marl and organic muck occur in the western part of Lee County near the coast. These sediments are not typically amenable to large-scale economical utilization due to the heterogeneous nature. Locally, the sediments may be utilized for fill on project sites, as well as for top soil and road fill.

No lands given a DOR code of 92 (mining, petroleum, gas lands) exist within the Village of Estero. No mines permitted by the Florida Department of Environmental Protection (FDEP) are located within the Village of Estero, although several do exist in the surrounding area, primarily to the east along Corkscrew Road. Some of these mines are located in the area shown as containing limestone as a mineral commodity in the FGS map series. These mines include West Lakes Excavation, University Lakes Mine, and FFD MEPD Mine, the latter of which covers an area shown as containing both limestone and undifferentiated resources. Bonita Farms I and II Mine is located in an area shown on the FGS map series as dominated by undifferentiated resources, but presumably the site contains commercially valuable mineral resources, such as limestone and/or sand. Based on FGS Map Series No. 130 and the presence of permitted mines in the immediate vicinity, commercially valuable limestone deposits likely exist in the eastern portion of the Village of Estero. However, this area has already experienced residential development.
and commercial development, with no large, undeveloped parcels remaining that would be necessary for a commercially viable mining operation.

According to FGS Map Series No. 130, two oil fields are located in Lee County, the West Felda and Lehigh Park fields. Both of these fields tap the Sunniland Formation as the production zone. In Lee County, the Sunniland production zone occurs at approximately 11,500 to 12,000 feet below land surface. Neither field falls within the boundary of the Village of Estero. No oil or gas production wells permitted through the FDEP, as taken from published FDEP datasets, occur within the Village of Estero. Permitted wells do exist to the east, but these sites have been identified as dry holes, indicating no oil or gas was present in economically extractable quantities. Given the geologic trend of the Sunniland Formation, it is unlikely that petroleum reserves on par with the West Felda and Lehigh Park fields exist within the Village of Estero.
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Commerically Valuable Minerals Map

NOTES
1. The permitted oil & gas wells shown were provided by FDEP and are dated September of 2016.
2. The mines shown were provided by FDEP, are dated September of 2016 and are referred to as ‘Mandatory Non-Phosphate Sites’.
4. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.
NOTES

1. The SFWMD potential wetlands layer shown displays most of the 6000 series FLUCFCS codes from the SFWMD version 2008-2009 land use / land cover data set. 6000 series FLUCFCS codes not displayed in this layer are displayed in the SFWMD potential estuarine wetlands layer.

2. The SFWMD potential estuarine wetlands layer shows displays FLUCFCS codes 6120, 6420, 6510 and 6520. This layer is based on the SFWMD version 2008-2009 land use / land cover data set.

3. The rivers, bays, lakes and ponds layer displays the 5000 series FLUCFCS codes from the SFWMD version 2008-2009 land use / land cover data set. It also displays hydro features from the 2007 FDEM LiDAR effort and certain features from the SFWMD hydroedge data set, dated October of 2014.

4. The Outstanding Florida waters shown were provided by FDEP and are dated October of 2016.

5. The nearest non-submarine spring is located approximately 46 miles northwest. This is based on the FDEP springs layer dated May of 2016.

6. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.
NOTES
1. The flood zones shown were downloaded from the FEMA website on January 4, 2016.
2. See FEMA panels for complete flood zone descriptions.
3. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.
NOTES
1. The Village of Estero boundary is completely covered by the Bonneted Bat consultation area but is outside of the Bonneted Bat focal area (USFWS, 2013).
2. The Village of Estero boundary is completely covered by the Woodstork core foraging areas for colonies 619310 and Corkscrew. Woodstork colony 619041’s core foraging area partially covers the Village of Estero boundary.
3. The bear locations shown are a combination of telemetry locations and nuisance reports. The latest telemetry location within the entire data set is dated September of 2007. The latest nuisance report within the entire data set is dated December of 2014.
4. Other species / consultation layers that were checked: Skink consultation area, Caracara consultation area, Caracara nests, RCW locations, Woodstork nests and positive scrub jay locations.
5. The seagrass habitat layer shown was provided by FFWCC and is dated July of 2016.
6. Estero Bay is all Smalltooth Sawfish Critical habitat.
7. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.
NOTES

1. The Rare and Unique uplands shown are part of the SFWMD version 2008-2009 land use / land cover data set.
2. The Rare and Unique uplands shown are defined by the Lee County Land Development Code, division 13, section 34-1571(2)d.2 and include areas mapped as sand scrub, coastal scrub, pine flatwoods, pine - oak, tropical hardwood, live oak hammock, and cabbage palm hammock within the Coastal Planning Area.
3. The locations of Rare and Unique uplands is approximate and have not been field verified.
4. The coastal planning area shown is designated by the Lee Plan.
5. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.
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SWFRPC 2010 SLOSH Map

NOTES
1. Storm Surge data from Southwest Florida Regional Planning Council 2010 update of the previous data developed for the Statewide Regional Evacuation Study. Detailed metadata available on the SWFRPC website [http://www.swfrpc.org/maps.html].
2. Coastal High Hazard Areas are defined by Lee County government as Tropical Storm and Category 1 surge areas.
3. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.
NOTES

1. The evacuation zones shown were provided by the Florida Department of Emergency Management. The latest edit date in the overall layer is December of 2013. Zones D and E do not occur with the Village of Estero boundary.
2. Population densities were calculated against the original census blocks. Those population densities were used to calculate population totals according to the geographic area within each evacuation zone occurring within the Village of Estero boundary. The population density for each census block was multiplied by the geographic area within each evacuation zone to come up with the adjusted population values.
3. The evacuation routes shown were taken from a map produced by Lee County titled "2015-2016 Evacuation Zones, Routes, and Public Shelters" created March 2015.
4. The Village of Estero boundary was provided by Lee County government and is dated October 1, 2015.