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of Southwest Florida
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Protecting Southwest Florida's unique natural environment and quality of life ... now and forever.

Corridors and Crossings: Protecting the Florida Panther & Florida Wildlife Corridor



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Introduction

In recognition of a commitment at the federal and state levels to protect a statewide corridor for the benefit of wildlife -particularly wide ranging animals like the endangered Florida panther- the Conservancy of Southwest Florida has assembled resources that stakeholders and agencies can utilize to prioritize land acquisition and protection efforts, as well as for the placement of large mammal structures at key points at roadways.

As an endangered species with as few as 120-230 Florida panthers remaining in the wild¹, vehicle strikes are the number one cause of known mortality.² Every year between 20 and 30 panthers are killed on Florida's roadways.³ With nearly 1,000 people moving to the state every day,⁴ continued development and roadway construction will increase this threat.

Underpass crossings and similar structures, properly sited and including fencing, have proven successful in reducing mortalities in key locations. As a species with large home range requirements and recovery plan goals that support the need for the panther population to expand northward, it is essential to secure landscape-level connections.⁵

While our focus is southwest Florida and the Florida panther, there may be additional needs for other common or imperiled wildlife throughout the state.

Mapping Data Resources

Florida Ecological Greenways Network and Critical Lands and Waters Identification Project

The Florida Wildlife Corridor Act was signed and codified in June 2021, effective as of July 1, 2021. The Act defines "Florida wildlife corridor" as conserved lands and opportunity areas classified as priority one, two, and three in the Florida Ecological Greenways Network (FEGN). FEGN is a model that is updated periodically for the purpose of delineating large connected areas of statewide strategic significance. FEGN is updated approximately every 5 years, and was updated in 2021. We used the 2021 data, and show priority one, two, and three in the same color of green on the maps herein.⁶

Please note that we also utilized many Florida Forever Board of Trustee projects as guidance and project boundaries as these areas have already been identified through Florida's "premier conservation and recreation lands acquisition program, a blueprint for conserving natural resources and renewing Florida's commitment to conserve the state's natural and cultural heritage."⁷

¹ <https://myfwc.com/wildlifehabitats/wildlife/panther/description/>

² https://ecos.fws.gov/docs/recovery_plan/081218.pdf

³ <https://myfwc.com/wildlifehabitats/wildlife/panther/pulse/>

⁴ <https://www.npr.org/2021/05/23/999202593/once-nearly-extinct-the-florida-panther-is-making-a-comeback>

⁵ https://ecos.fws.gov/docs/recovery_plan/081218.pdf

⁶ <http://conservation.dcp.ufl.edu/fegnproject/>

⁷ <https://floridadep.gov/lands/environmental-services/content/florida-forever>

The Florida Ecological Greenway is the basis of the Florida Wildlife Corridor, and is one of the sets of data that makes up Critical Lands and Waters Identification Project (CLIP). CLIP is a GIS database of statewide conservation priorities for everything from natural resources, biodiversity, landscape function, surface water, groundwater, and marine resources.

Florida Panther Recovery Implementation Team Transportation Subteam

The Panther Recovery Implementation Team (PRIT) Transportation Subteam was established around 2014 with the goal of addressing the issues of vehicular mortality and habitat loss as collisions with vehicles is acknowledged as a direct leading cause of panther injuries and death. The Subteam focused on identifying opportunities and conflicts to addressing this threat to recovery. The Subteam included members of academia, transportation and wildlife agencies, local transportation planning organizations, and non-governmental organizations.

To-date, the Subteam has produced two reports: one that looks at permeability at Interstate 4 in Central Florida, and the other looking at well-known panther-vehicle collision hot spots in southwest Florida. We utilized the latest hot spot data in our mapping, which includes collision data through 2021 (Figure 1).

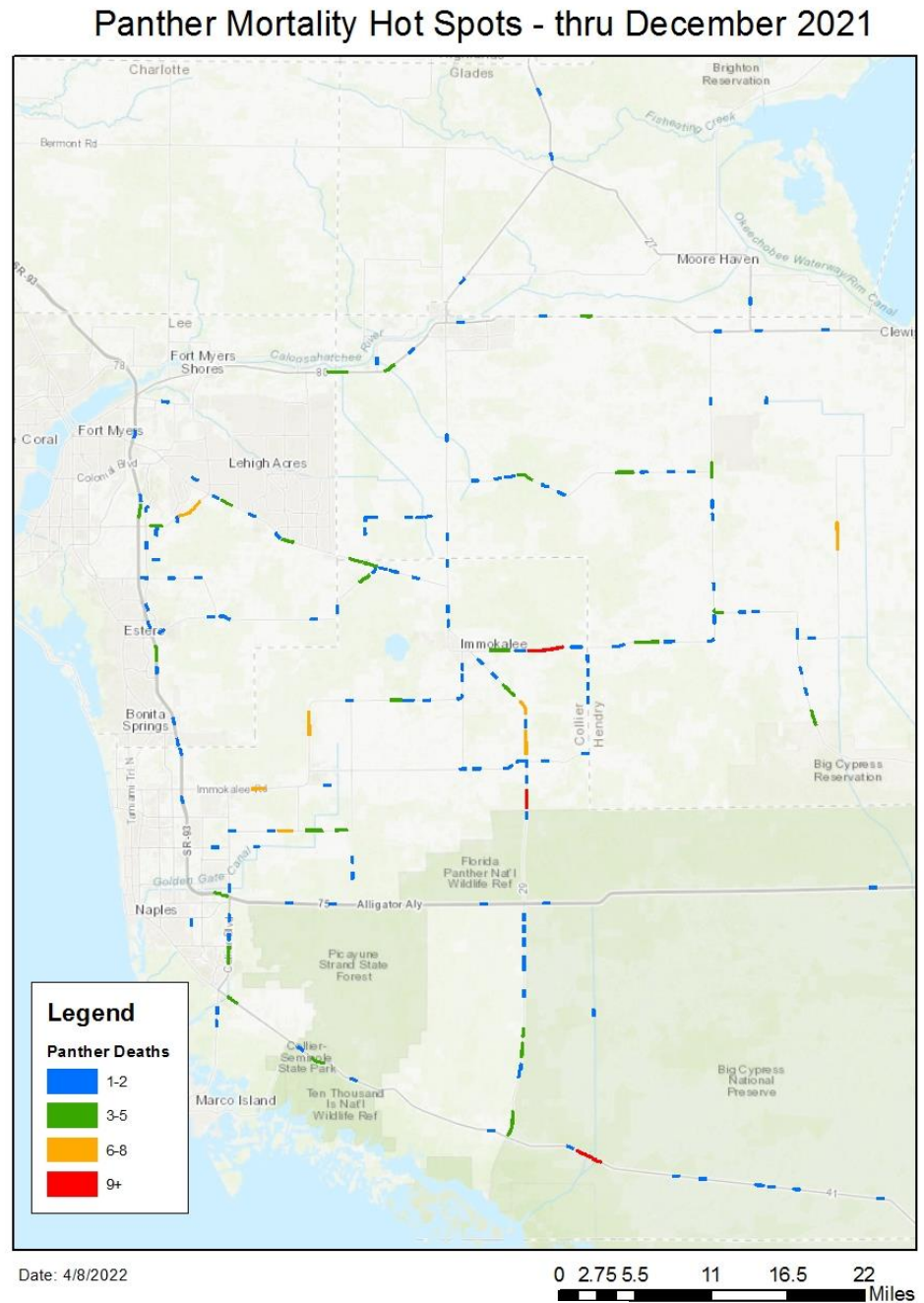


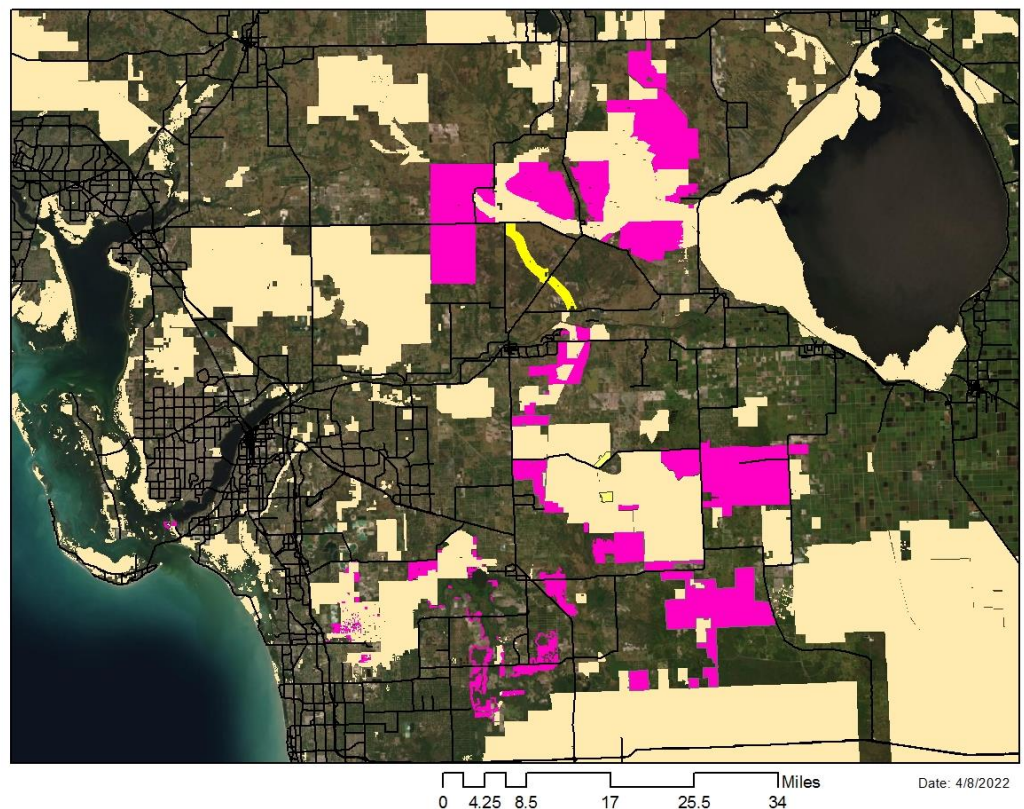
Figure 1

Priorities for Acquisition/Easements

- **“Devil’s Garden”** in Hendry (particularly along CR835 and the property formerly known as Keri Road Sand Mine)⁸
- **“Fisheating Creek”** in Glades and Highlands⁹
- **“Caloosahatchee Ecoscape”** in Glades and Hendry
- Select areas within the **Rural Lands Stewardship Area “Half Circle L Ranch”** in Collier County and **“Corkscrew Regional Ecosystem Watershed” (CREW)** in Lee and Collier counties that aren’t already protected or proposed as mitigation for other uses
- **“Eden Oak”** in Lee County
- **“Panther Glades”** & **“12 Mile Slough”** in Hendry County
- Corridor connections linking south Florida to panther habitat north of Interstate-4

Hot pink shows the properties in Southwest Florida we will be highlighting in this paper.

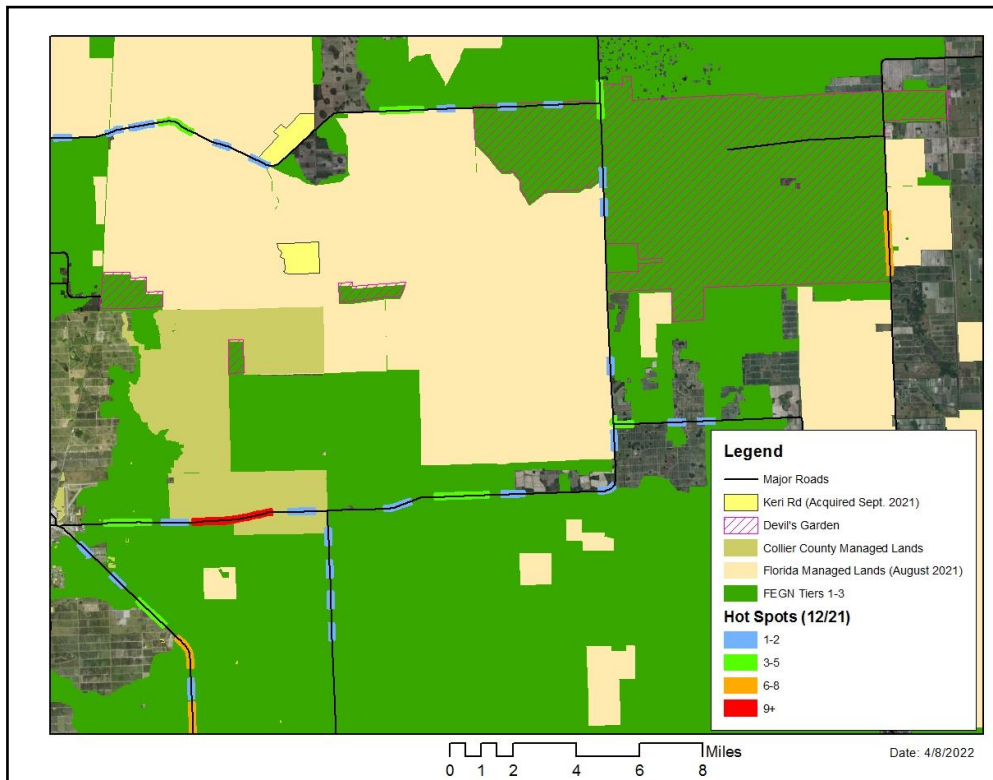
Cream represents already managed lands. The long yellow snake is a conservation easement in Fisheating Creek approved for easement acquisition on March 29, 2022. The smaller yellow parcel is Keri Road in Hendry County, part of the Devil’s Garden project acquired in September 2021.



⁸ The property formerly proposed as a mine, known as Keri Road Sand Mine, within the Devil’s Garden Florida Forever Project was approved for acquisition on September 21, 2021, and is now owned by the state of Florida.

⁹ An easement over the Chapparral Slough area Fisheating Creek area in Glades County was approved on March 29, 2022.

Devil's Garden



Devil's Garden has been on the Florida Forever Priority List since 2002.

Acquiring parcels in this Florida Forever project will help increase protection of Florida's biodiversity at the species, natural community, and landscape levels.

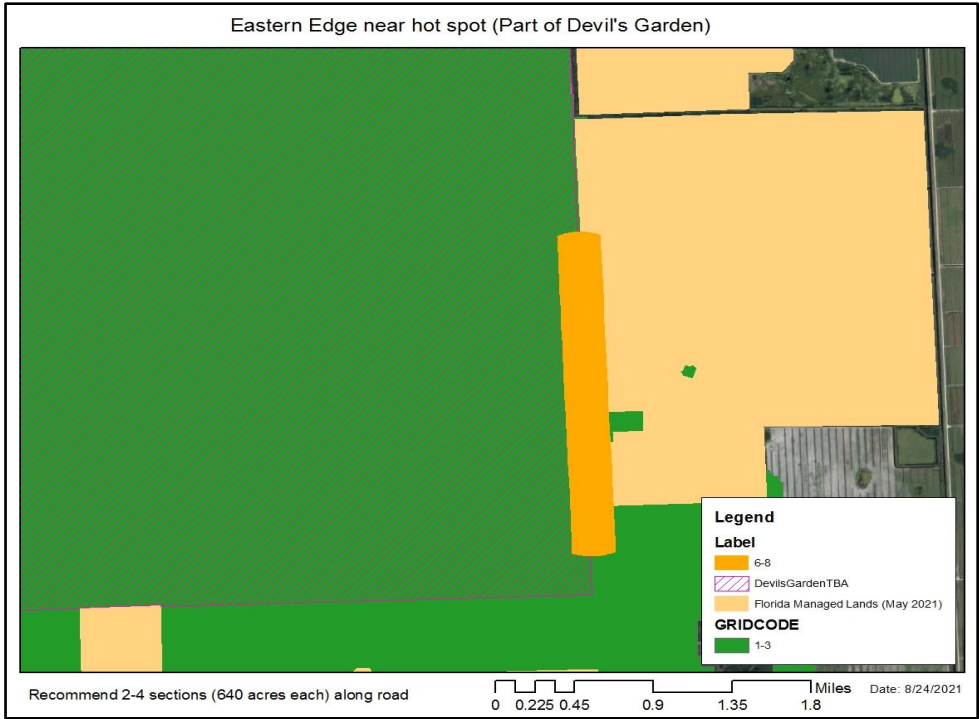
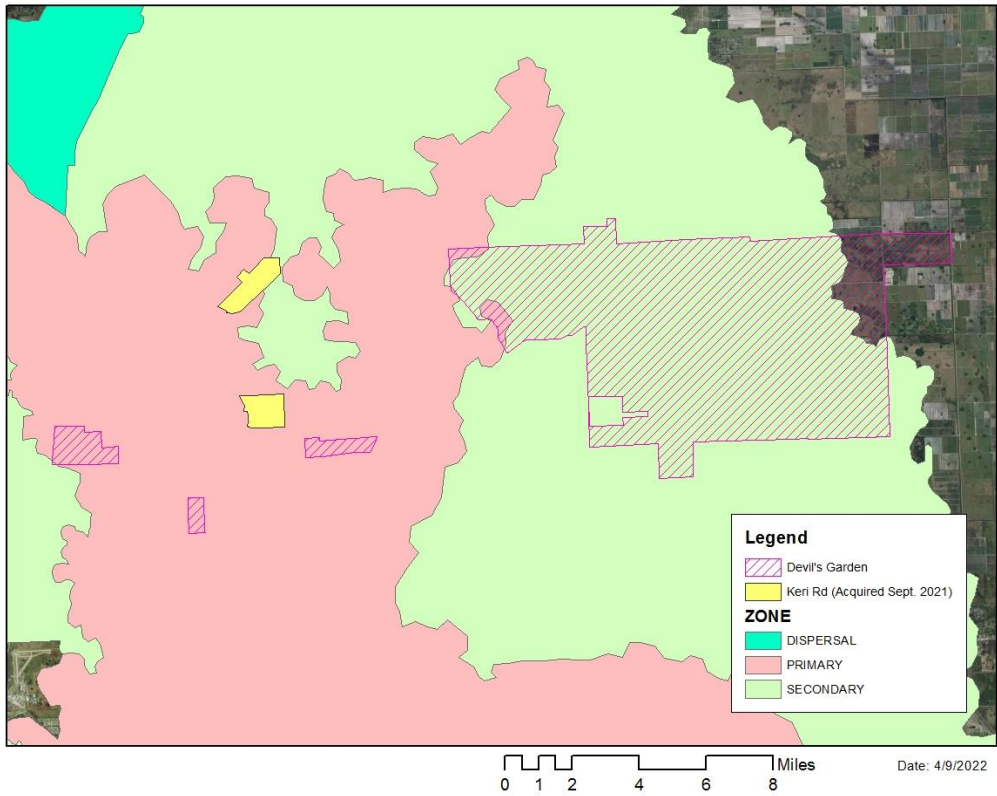
Devil's Garden is a significant tract of ranch land that has been impacted by cattle ranching activities (conversion to pasture) and to a lesser extent by agriculture. Non-forested wetlands, including basin/ depression marsh,

swale, and wet prairie make up the dominant natural communities still present on the property.

The Devil's Garden parcels contain essential habitat for the Florida panther, as over 4,000 acres is considered Primary Zone and over 38,000 acres is considered Secondary Zone panther habitat.¹⁰

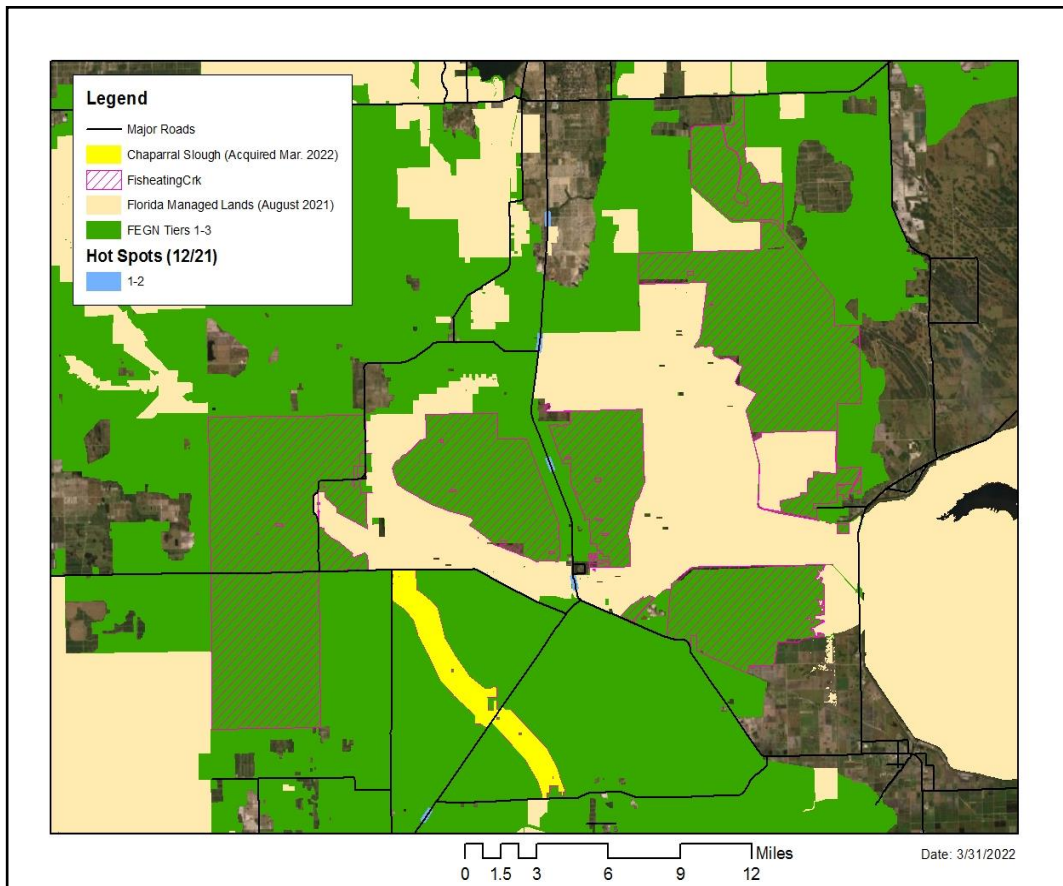
Protection of the Devil's Garden area may also help reduce panther road kill mortality. On the eastern side of the boundary, there is a significant stretch of this road with high panther mortality, as evidenced by the panther-vehicle collision hot spot on CR835. To the west is the Devil's Garden Florida Forever project lands that have not yet been acquired. To the east are protected lands. Acquisition of at least a portion of the Devil's Garden project parcels along this hot spot road segment could allow for a wildlife underpass and better opportunities to manage lands on both sides of the road for habitat connectivity.

¹⁰ Kautz et al, 2006. How much is enough? Landscape-scale conservation for the Florida panther. *Biological Conservation* 130: 118-133.



Fisheating Creek

Fisheating Creek is over 50 miles long, spanning from Highlands County to Lake Okeechobee. It is the only remaining free-flowing water course feeding into the lake, and the second-largest natural source for the lake.¹¹



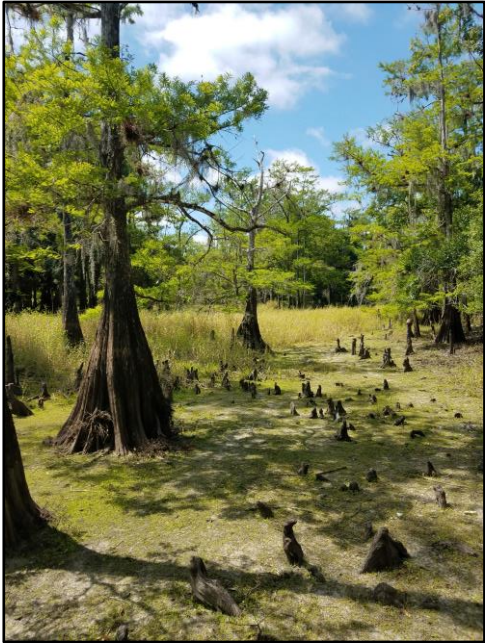
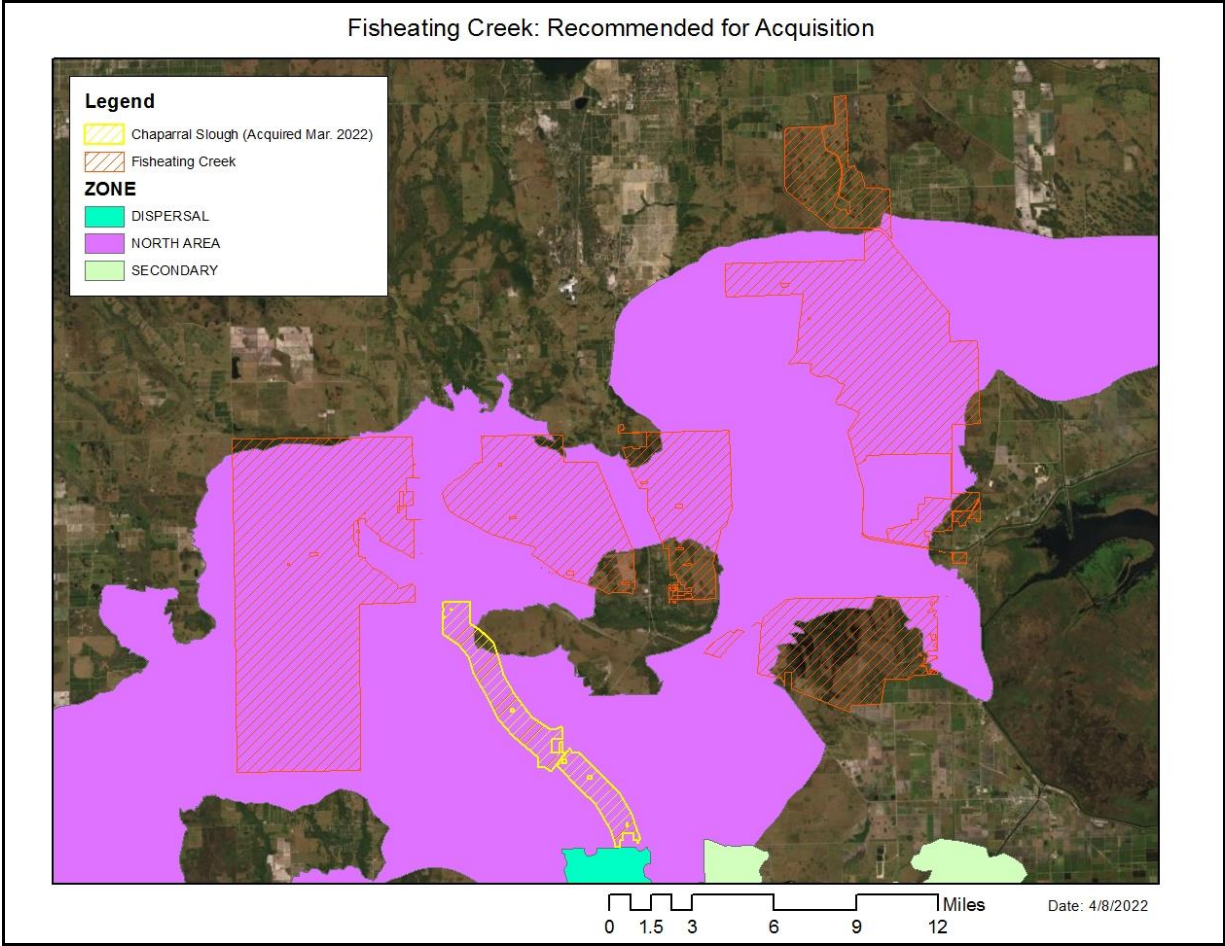
The Chaparral Slough project area—eleven miles long and one mile wide—runs along Chaparral Slough, a tributary to Cypress Branch, and is part of the 122,213-acre Fisheating Creek Ecosystem Florida Forever Project.¹² An easement for the Chaparral Slough was approved at the March 29, 2022 Florida Cabinet meeting.

The Fisheating Creek Ecosystem, if fully protected, would create connectivity between Lake Okeechobee, Babcock-Webb Wildlife Management Area, and could link to Dispersal Zone/Caloosahatchee Ecoscape, and allow improved access to the 99,545 acre “North Panther Area.”¹³ It is the only undammed tributary to Lake Okeechobee.

¹¹ https://en.wikipedia.org/wiki/Fisheating_Creek#:~:text=Fisheating%20Creek%20is%20a%20stream,natural%20source%20for%20the%20lake

¹² <https://www.nature.org/en-us/newsroom/lykes-chaparral-slough-florida-panther-corridor-protection/>

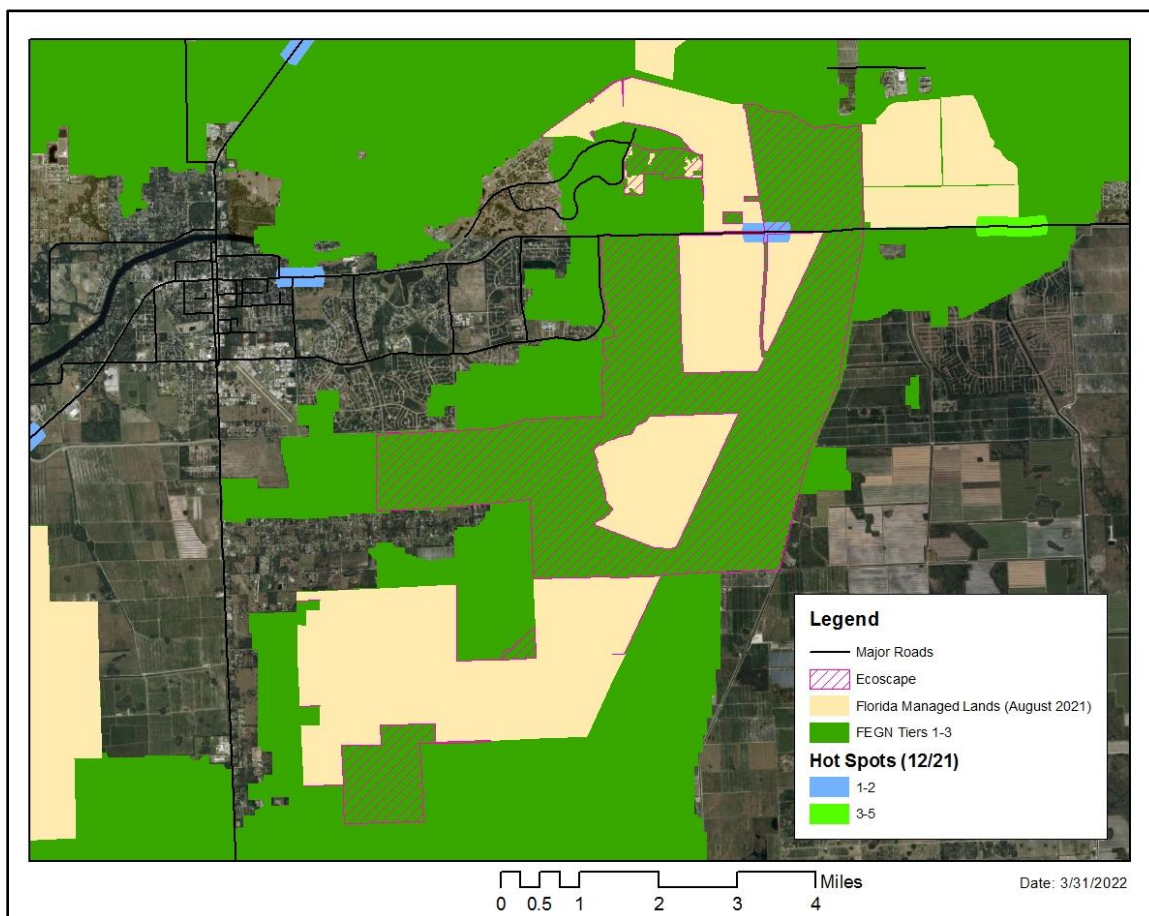
¹³ Thatcher, et al., 2006. Identifying Suitable Sites for Florida Panther Reintroduction. Journal of Wildlife Management.



Caloosahatchee Ecoscape

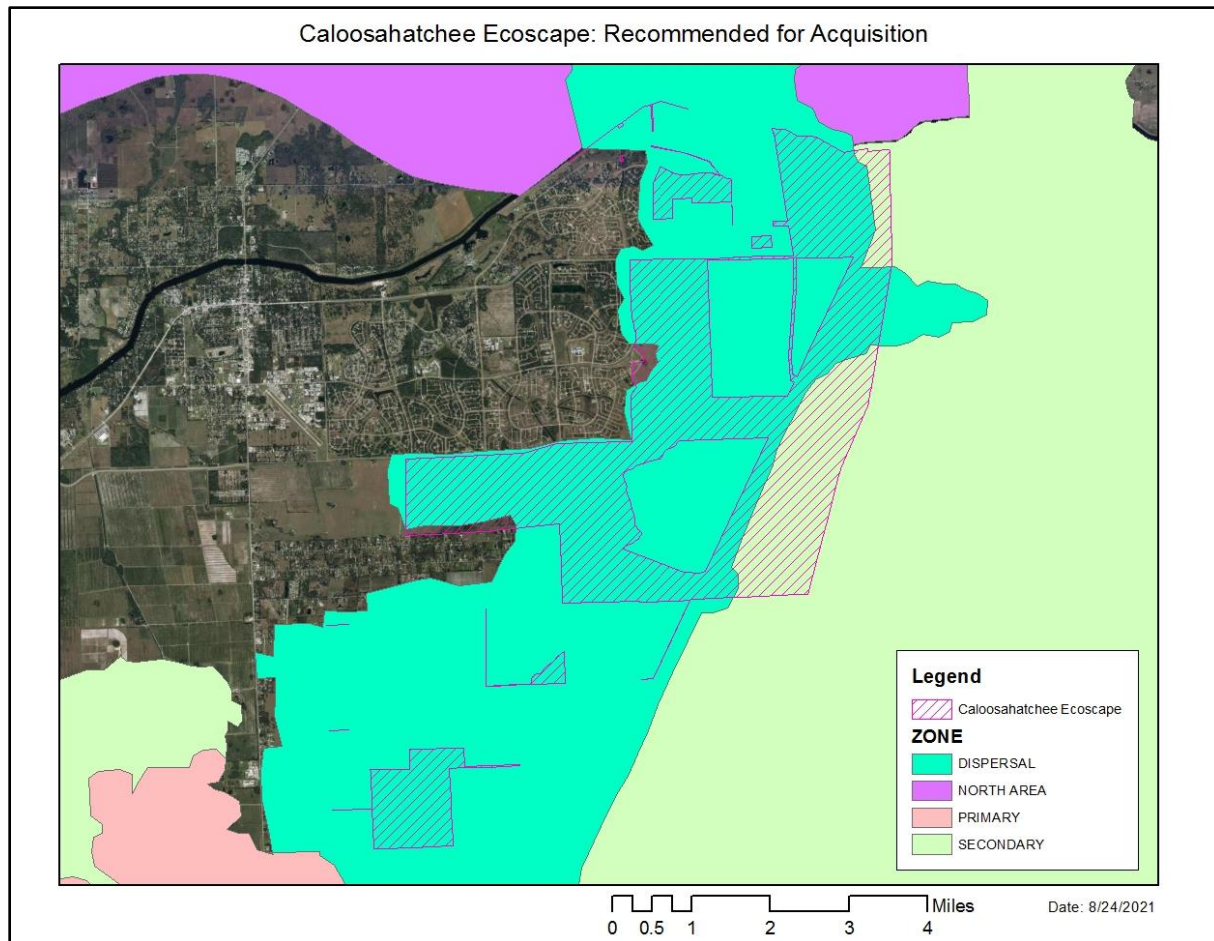
In order to preserve Florida panthers and other wide-ranging species such as bears, landscape linkages must be protected. Although there are large areas of protected lands in south Florida, recovery of the Florida panther depends on protecting the habitat core in south Florida as well as links to central Florida.

The Caloosahatchee Ecoscape project has a mosaic of wet prairies, cypress swamp, mesic flatwoods, wet flatwoods, depressional marshes, and scrub. The majority of the natural communities on the properties have been impacted by clearing and drainage from improved pasture development or farming. Albeit the areas has been disturbed for ranching and other agriculture, the project provides key habitat for a number of listed species.¹⁴



¹⁴ https://floridadep.gov/sites/default/files/FLDEP_DSL_OES_FF_BOT_CaloosahatcheeEcoscape.pdf

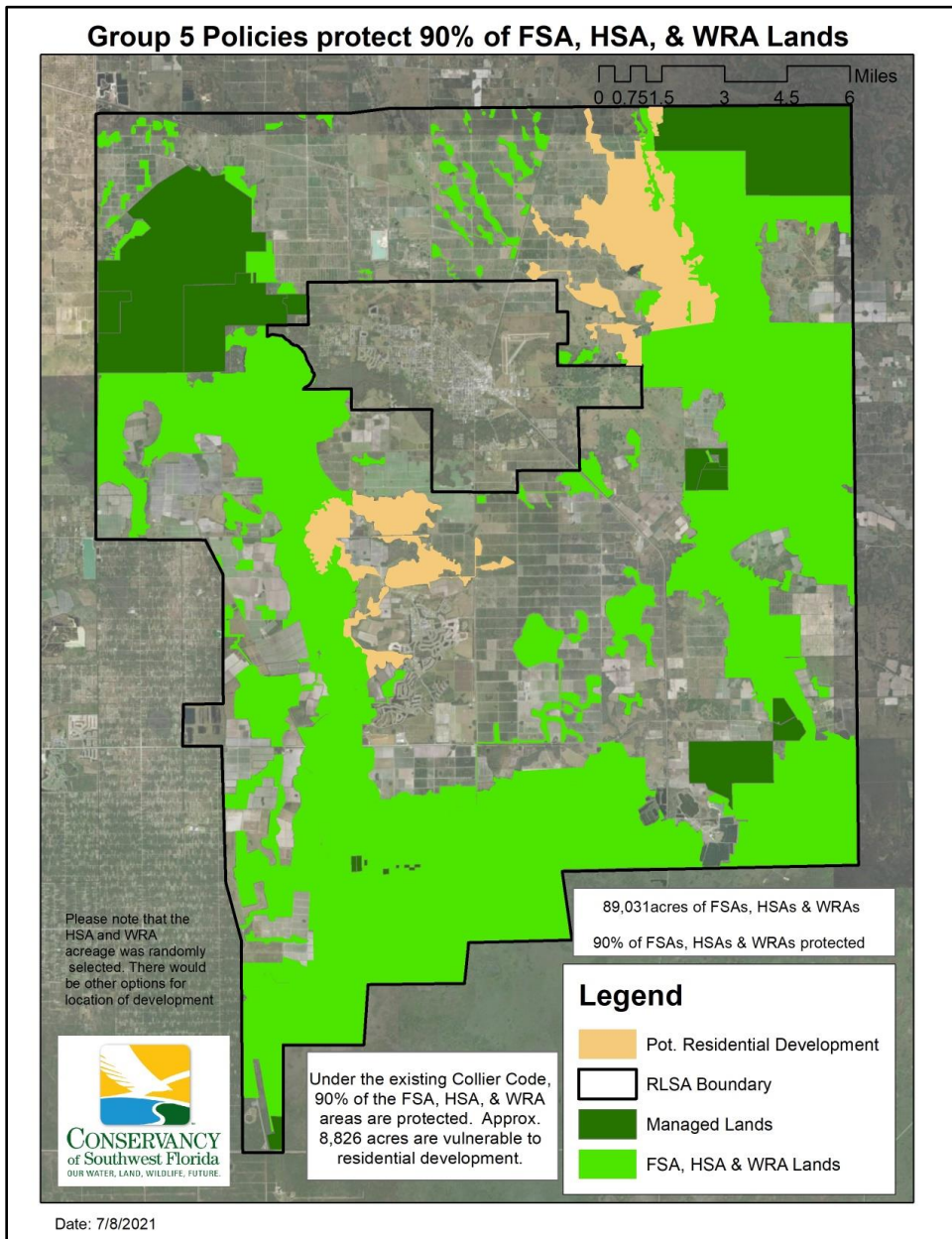
This project area includes about 7,539 acres of the Dispersal Zone that is so essential to providing linkage from south Florida to areas north of the Caloosahatchee River.¹⁵



¹⁵ Kautz et al, 2006. How much is enough? Landscape-scale conservation for the Florida panther. Biological Conservation 130: 118-133.

Eastern Collier County Rural Lands Stewardship Area

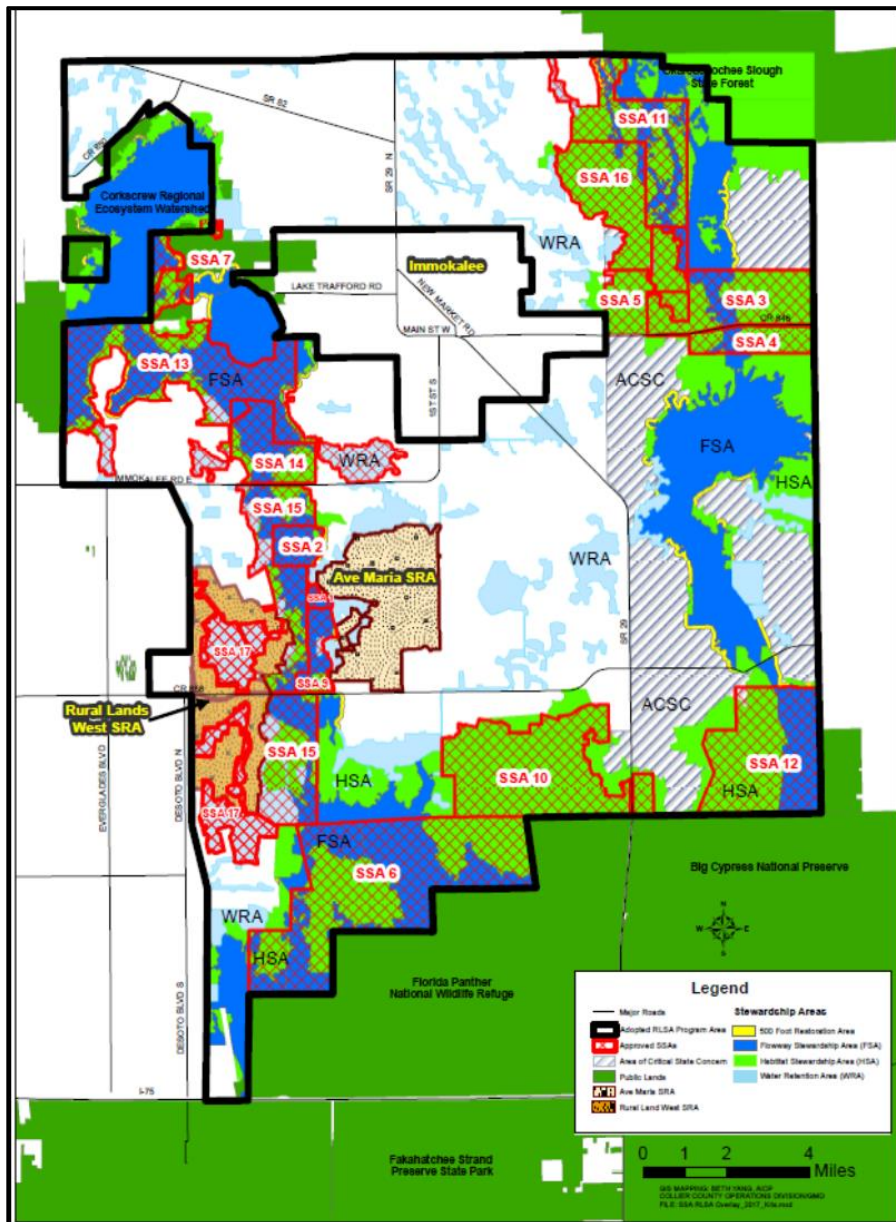
Our recommendation for the Rural Lands Stewardship Area (RLSA) within Collier County is to focus on truly vulnerable areas that have high natural resource values, particularly those lands within Primary Zone panther habitat and Adult Breeding Habitat.¹⁶



The RLSA is a Collier County overlay. Even without participation in the program, there are noteworthy protections at the local level within the Comprehensive Plan for much of this area. Designation by Collier County as a Flowway Stewardship Areas (FSAs), Habitat Stewardship Areas (HSAs), and Water Resource Areas (WRAs), shown in light green have specifications regarding how much site clearing or development is allowed. For example, the FSAs do not allow residential, earth mining, and other similar impactful uses. Additionally, lands within the Area of Critical State Concern (ACSC) adds limitation on the amount of clearing that can be done. The ACSC is shown on the map on the next page.

¹⁶ Frakes et al., 2015. Landscape Analysis of Adult Florida Panther Habitat. PLoS ONE, 10(7): e0133044. DOI: 10.1371/journal.pone.0133044.

Landowners in eastern Collier County have also designated some portions of their land as Stewardship Sending Areas (SSAs), which serve to generate development credits that are transferred to other parcels within the RLSA where development, such as town and villages, are allowed. And finally, many areas in eastern Collier County have been proposed as mitigation for development through various regulatory processes.

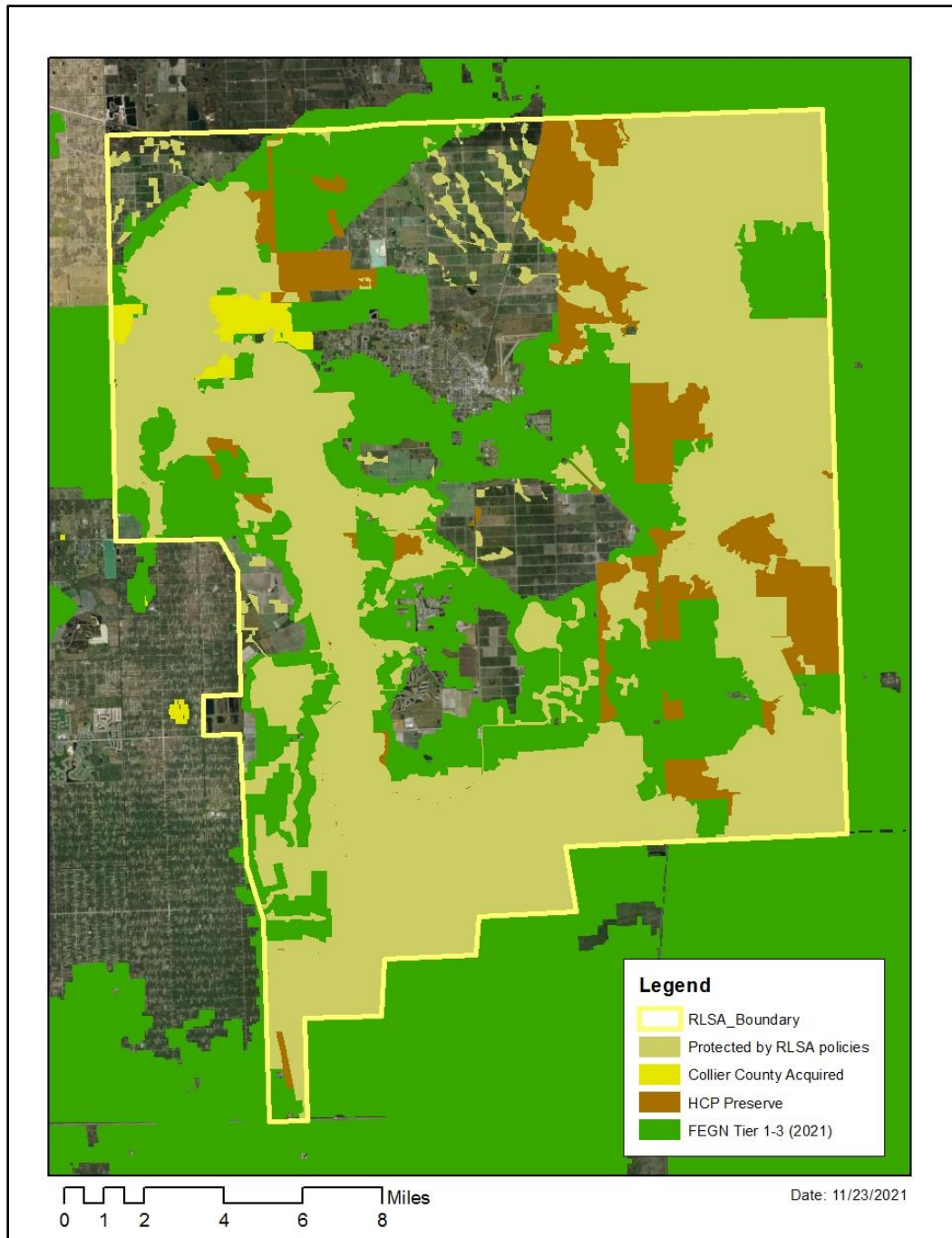


Map from Collier County:

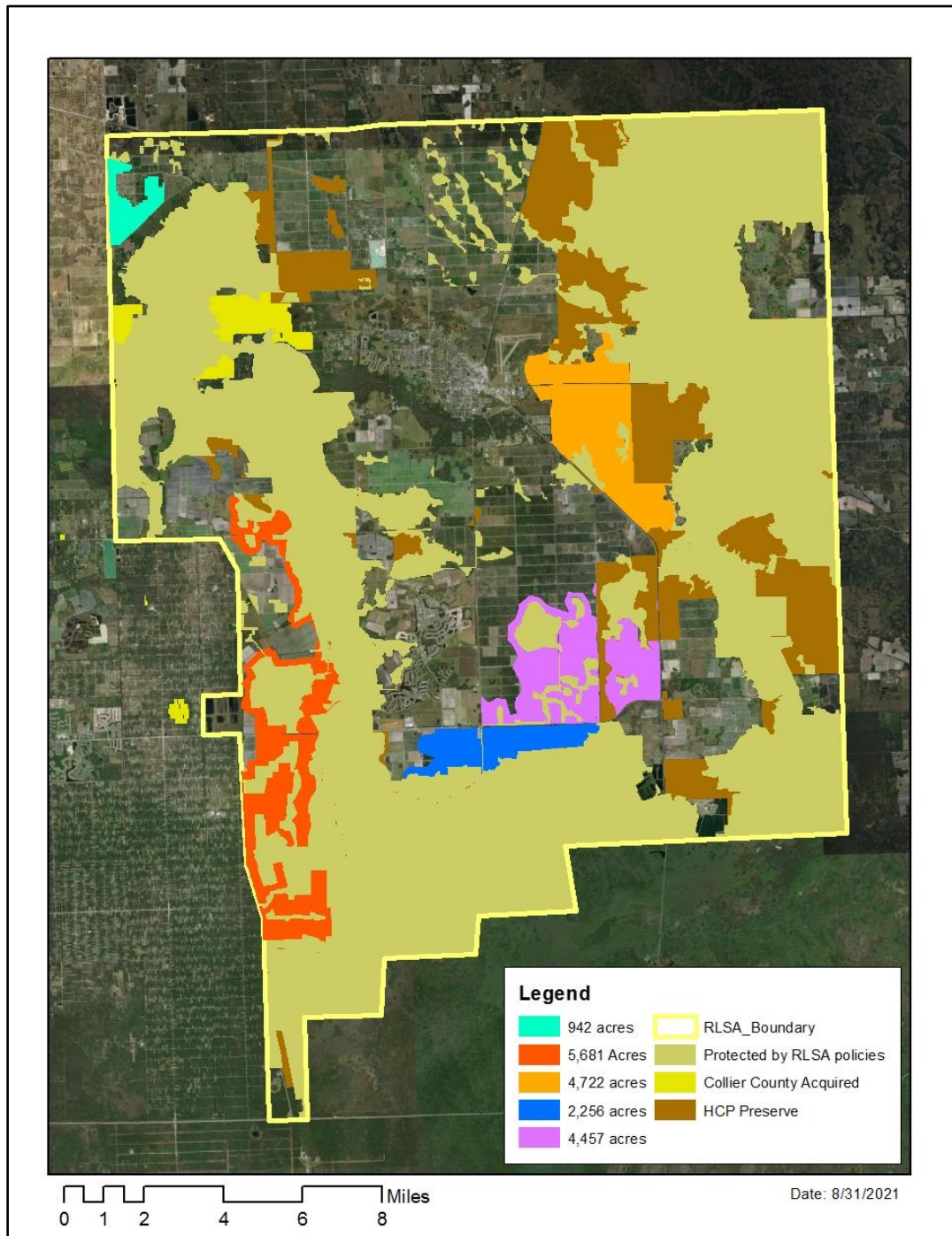
<https://www.colliercountyfl.gov/home/showpublisheddocument/76473/636505884606870000>

Thus, given the protections provided by these various considerations, we recommend public land acquisition or easements in the remaining areas most vulnerable to development that are within important panther habitat.

This map shows in green the areas that are Florida Wildlife Corridor Tiers 1-3, but not protected by the aforementioned programs or proposals. These are the lands that should be targeted for acquisition.



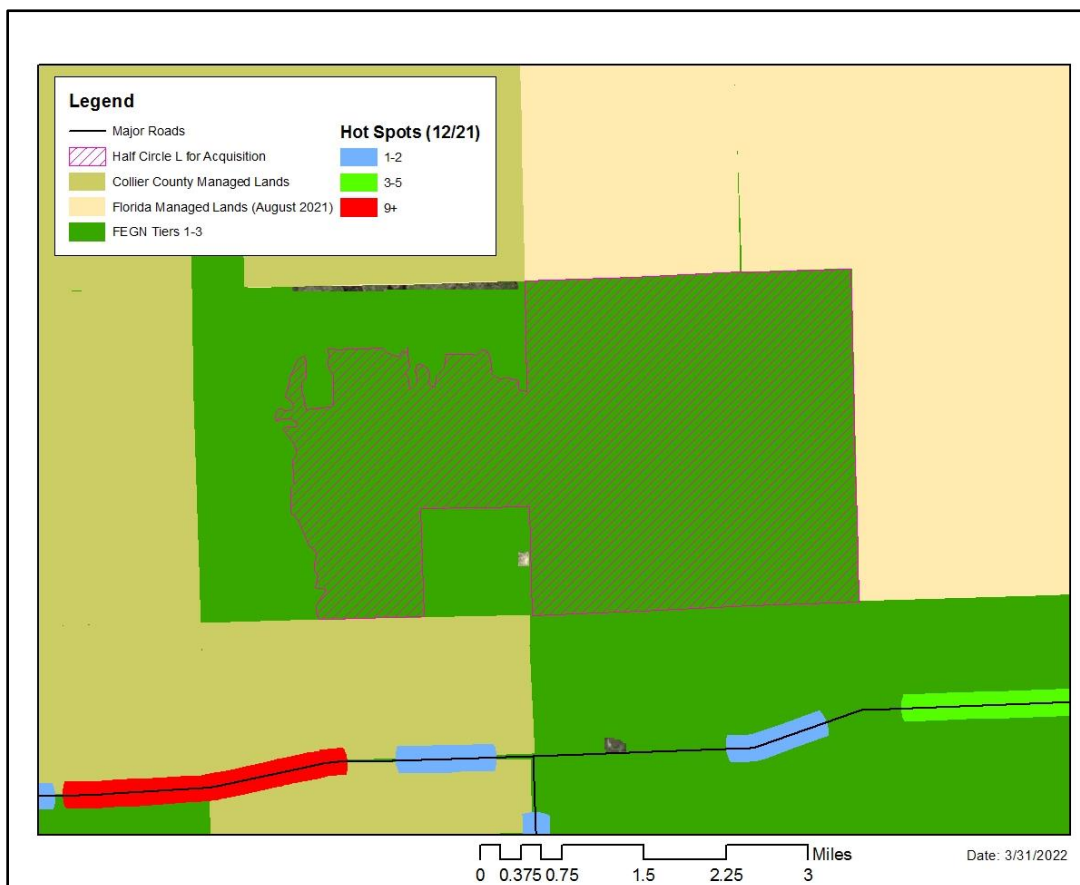
We've identified 5 separate areas (as identified on the left hand side of the map legend below) that are essential Primary Zone panther habitat, but not protected by Collier County policies or the proposed mitigation areas. These acquisitions would provide connectivity in and through the RLSA, and protect some of the most important core habitat areas.



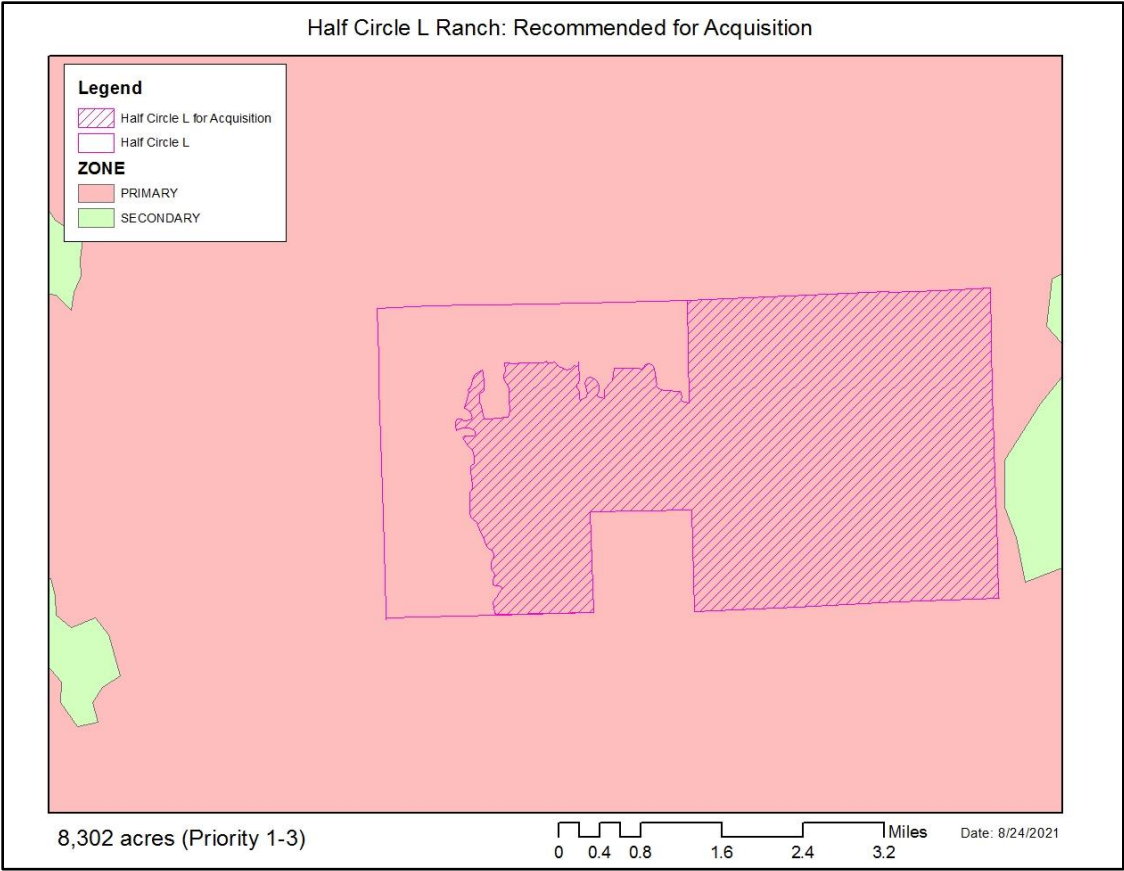
Half Circle L Ranch

This parcel provides important opportunities for protection of the panther, black bear, and other endangered and threatened species. Consistent with our recommendation above, we recommend focusing acquisition on the portion of this property not already protected by Collier County policies or other similar programs, depicted below is cross-hatch.

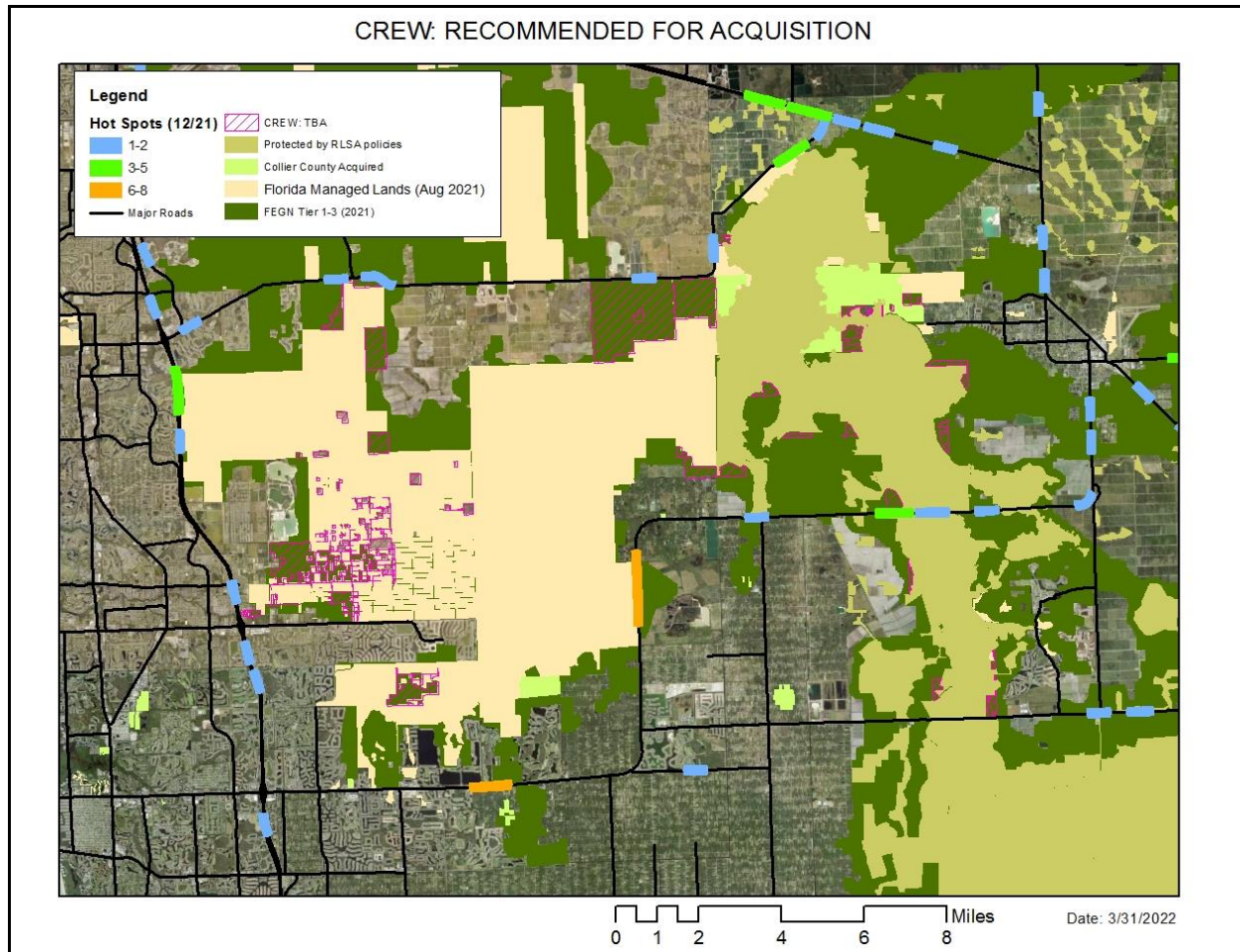
The dominant communities on the property are basin and depression marshes, wet prairies, hydric/mesic hammocks, and wet/mesic flatwoods. Forty-five percent of the project has been converted to improved pasture, row crops, and citrus. Habitat and hydrological restoration of disturbed areas is another goal of state acquisition of this project.



Located within Primary Zone habitat for both the Florida panther and the black bear, the project compliments the ongoing conservation efforts in this region for these and numerous other species.



Corkscrew Regional Ecosystem Watershed (CREW)



The Corkscrew Regional Ecosystem Watershed (CREW) extends over more than 60,000 acres in both Lee and Collier Counties. These lands provide flood protection, water quality treatment, and recharge to our aquifers. The CREW watershed also is essential habitat for wildlife, such as the Florida panther, snail kite, and wood stork. CREW is composed of CREW Marsh, Flint Pen Strand, and Bird Rookery Swamp.¹⁷ Also within the project area, a parcel formerly known as “Edison Farms” along Interstate 75 was acquired by Lee County in 2019.

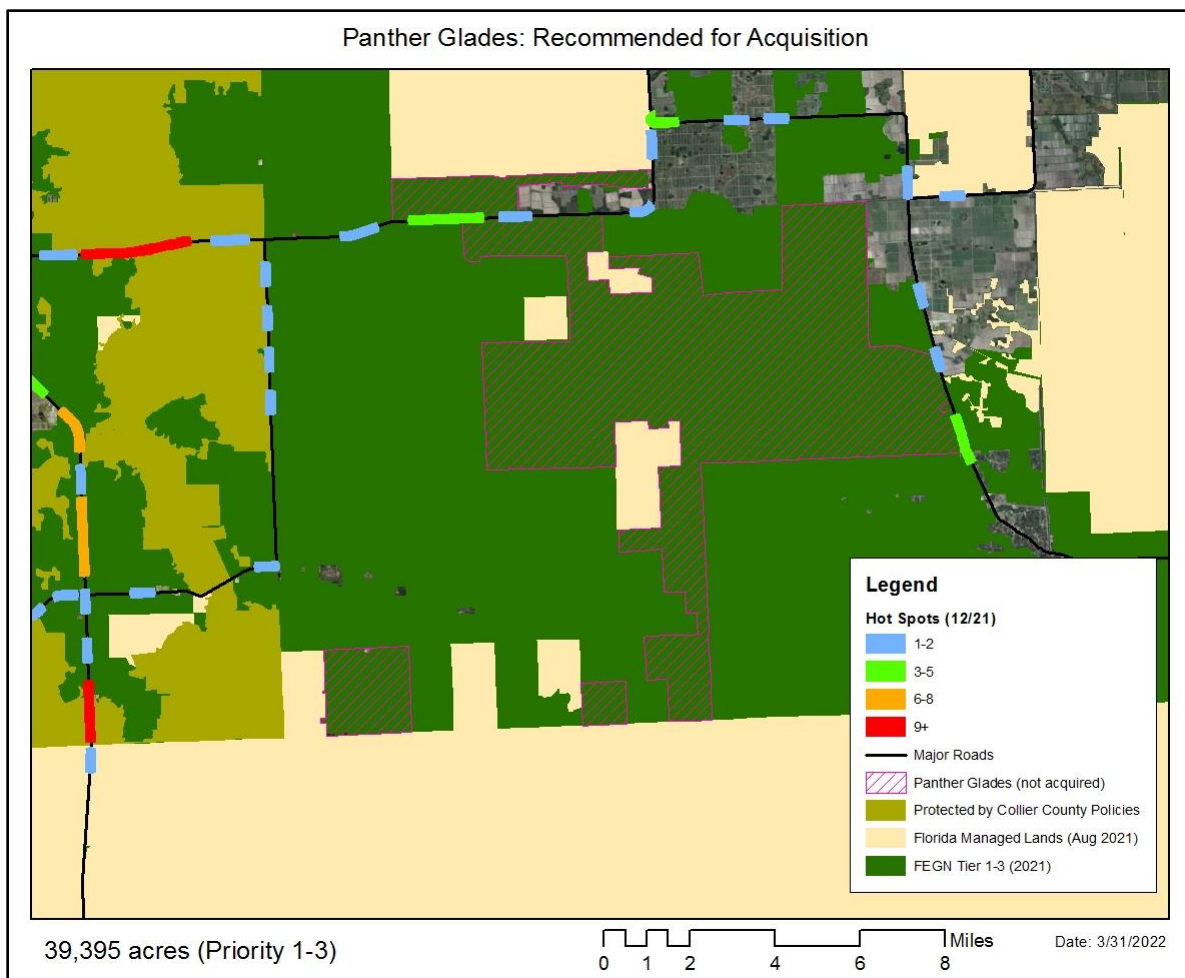
State and federal land acquisition should focus on targeting the CREW Headwaters (added in 2016) and smaller parcels within the CREW boundary not already protected by the RLSA or offered as mitigation for regulatory requirements under permitting programs.

¹⁷ <https://www.sfwmd.gov/recreation-site/corkscrew-regional-ecosystem-watershed-crew>

Panther Glades

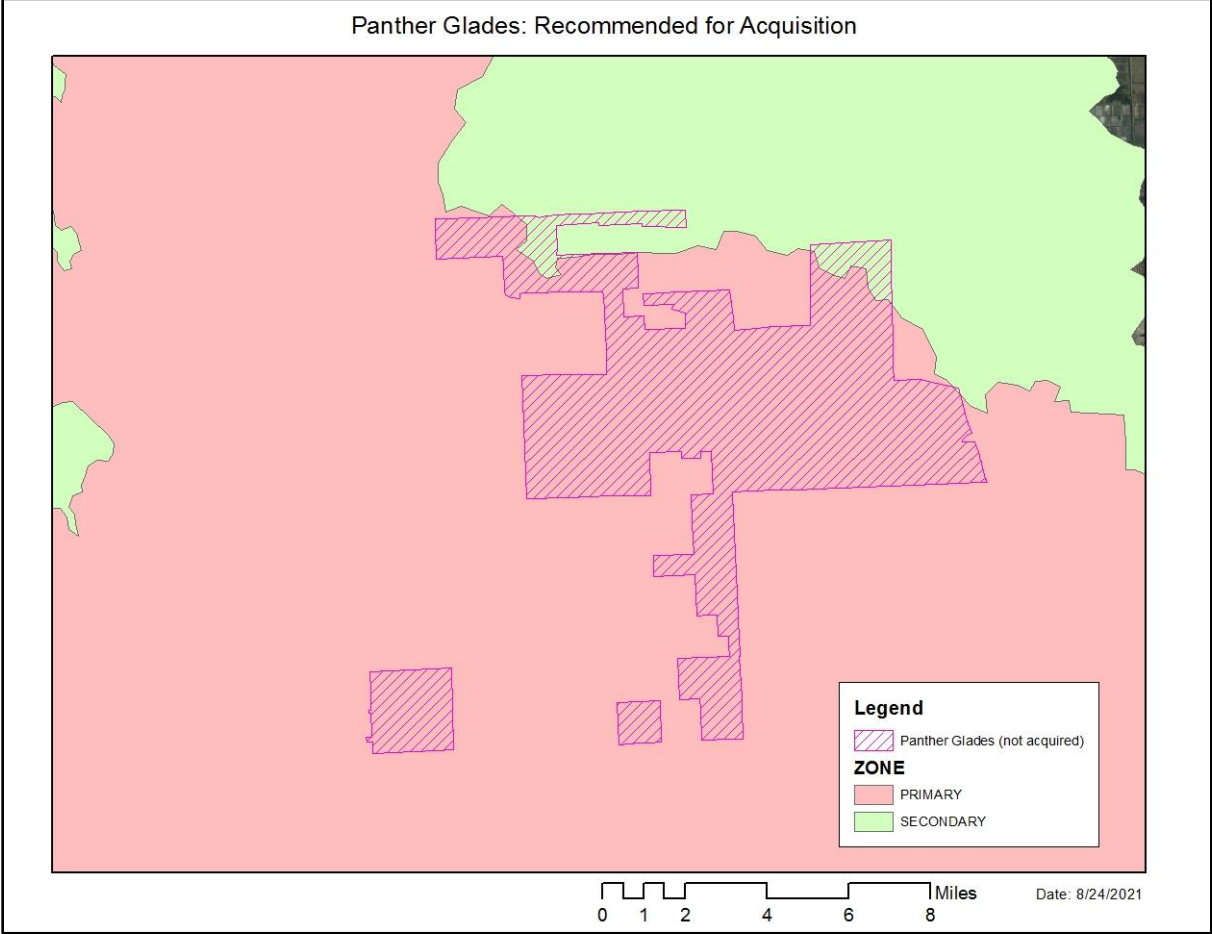
This Florida Forever project forms a connection between Devil's Garden, Okaloacoochee Slough State Forest, and the Big Cypress National Preserve.

Panther Glades is located in south-central Hendry County, lying about twenty-five miles southeast of Clewiston and forty-six miles northeast of Naples. The project is made of a mosaic of forested uplands interspersed among forested wetlands.¹⁸ It is important to many wildlife species, particularly the Florida panther and the Florida black bear, since these species require large areas of habitat to maintain viable populations.

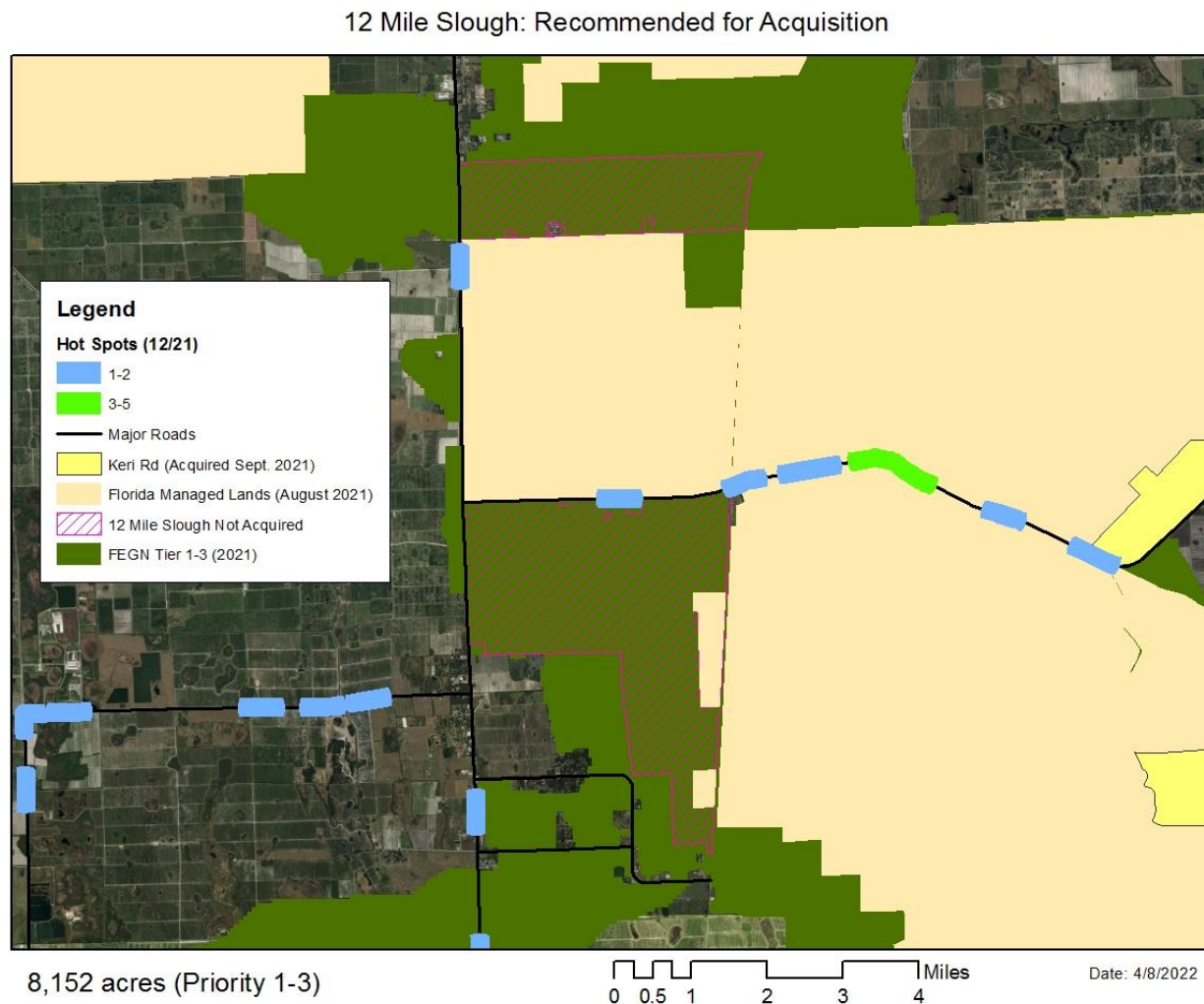


The area includes nearly 37,000 acres of Primary Zone panther habitat, and another 2,400 acres of Secondary Zone.

¹⁸ https://floridadep.gov/sites/default/files/FLDEP_DSL_OES_FF_BOT_PantherGlades.pdf



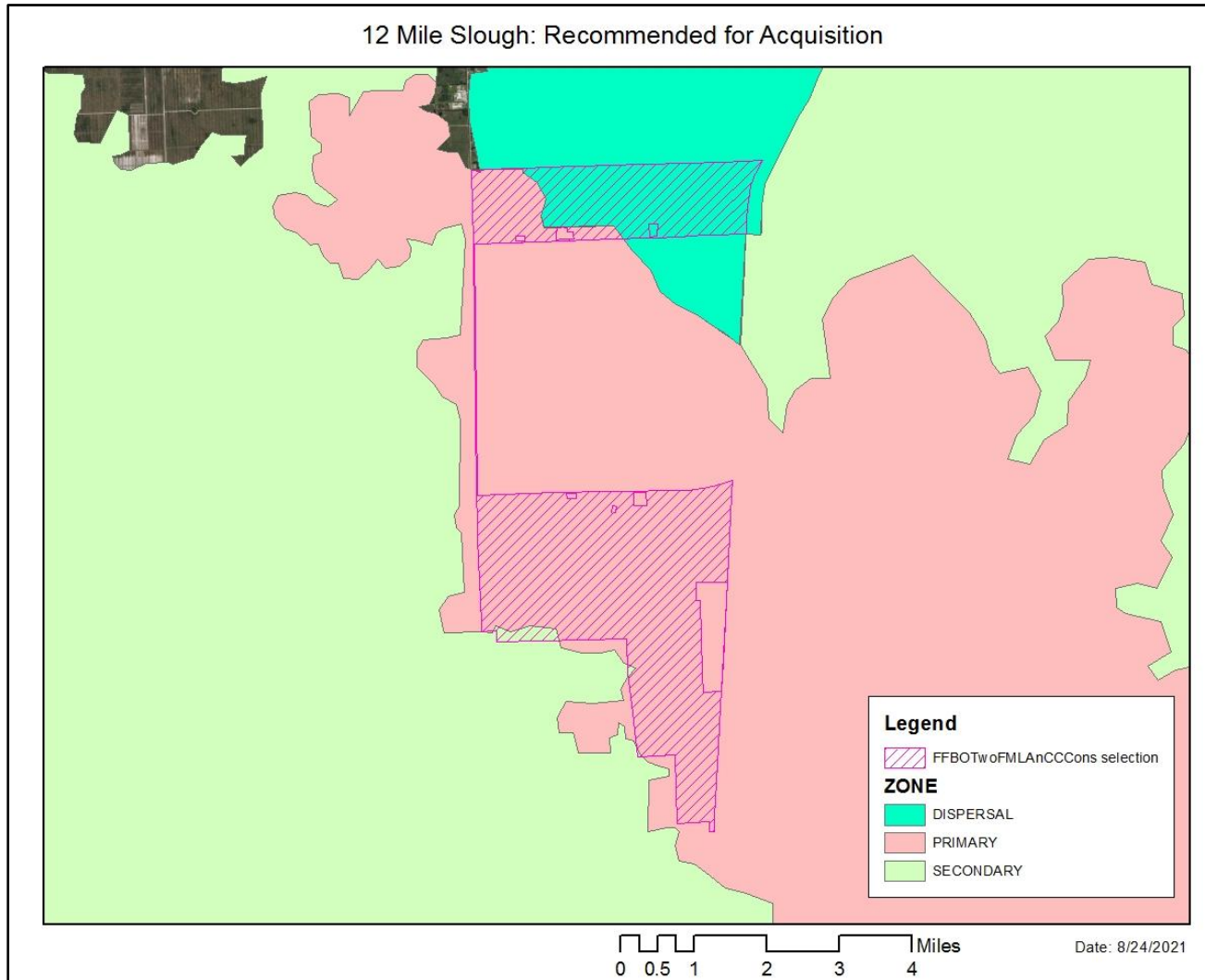
12 Mile Slough



12 Mile Slough is adjacent to the 32,000 acre Okaloacoochee Slough State Forest in Hendry County, ten miles south of the Caloosahatchee River. 12 Mile Slough is a part of the larger Okaloacoochee Slough wetlands. The total acreage of the project is 15,967 acres, of which 7,797 acres are now in conservation. The addition of the remaining 12 Mile Slough project land would fill a gap in the all-important Big Cypress-to-Fisheating Creek linkage.¹⁹

¹⁹ <https://floridawildlifecorridor.org/missing-links-2/twelvemile-slough/>

Within the 12 Mile Slough Florida Forever project, about 6,307 acres fall within the critical Primary Zone panther habitat area, and the remainder is Dispersal Zone and Secondary Zone at about 1,740 acres and 104 acres, respectively.



Eden Oak



Eden Oak is a parcel at the mouth of the Caloosahatchee River in Lee County that is composed of salt marsh and mangroves. However, this project has been targeted for residential development, and has been an applicant to the local land acquisition program Conservation 20/20.

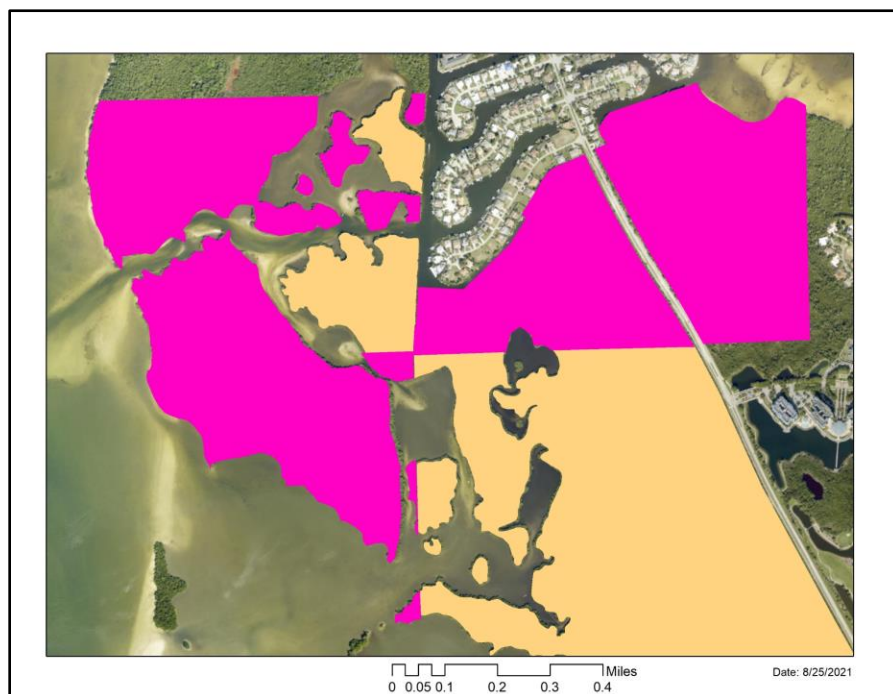
We are in support of protecting this parcel as a conservation area for many reasons although it falls outside the criteria set forth for the Florida Wildlife Corridor. We do note that the property is designated as Tier 5 by FEGN, and is extremely important and unique. The property is flagged as both manatee critical habitat, as well as endangered smalltooth sawfish critical habitat.

Notably, this property also is within the Lona Cove area that has been documented as one of the limited smalltooth sawfish pupping areas, essential for future survival of the sawfish. Thus, the habitats in and around the Eden Oak project are unique and irreplaceable.



*Conservancy staff member with Florida Fish and Wildlife
Conservation Commission sawfish researchers.*

The US Fish and Wildlife Service has also previously recognized this property as an Aquatic Resource of National Importance (ARNI), and indicated that these areas cannot be replaced, given their high value and placement close to three National Wildlife Refuges, and adjacent to the Estero Bay Preserve State Park.

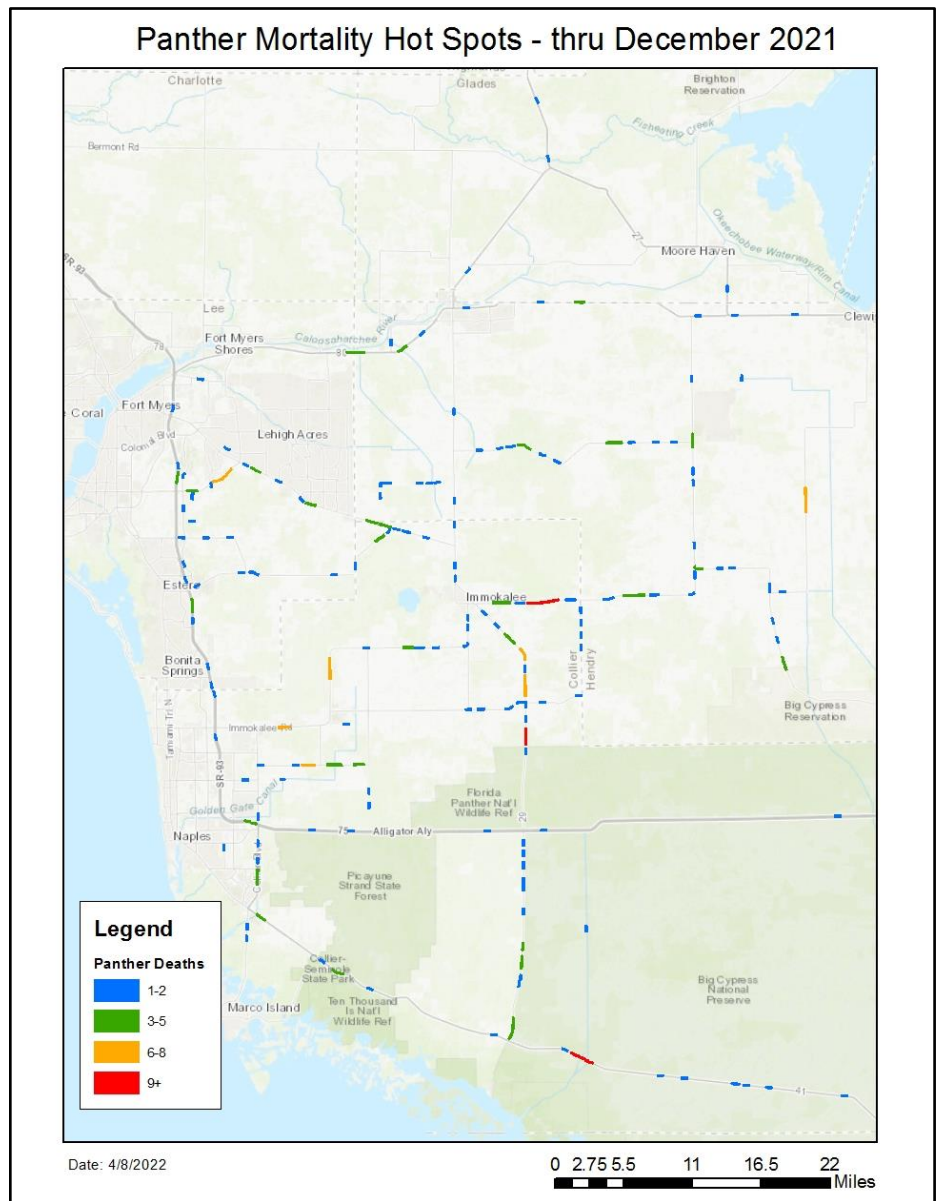


Improving Connectivity through Structures and Underpasses

Remedying Hot Spots in South Florida

The Panther Recovery Implementation Team Transportation Subteam has identified panther-vehicle collision hot spots in southwest Florida and this model will continue to be updated annually to reflect new data.²⁰ This report shows priority needs, based on severity of panther-vehicle collisions.

As southwest Florida is the current core and last remaining area supporting the breeding population, improving these hot spots through the placement of functional crossing structures is of dire importance.



²⁰ Florida Panther Recovery Implementation Team Transportation Subteam, 2020. Southwest Florida Road Hot Spots, 2.0. June, 2020, reflecting data through 2019. The agencies have updated the model through 2021, and new data may alter the severity or length of the hot spot.

<https://conservancy.org/wp-content/uploads/2022/03/Hotspot-Report-final.pdf>



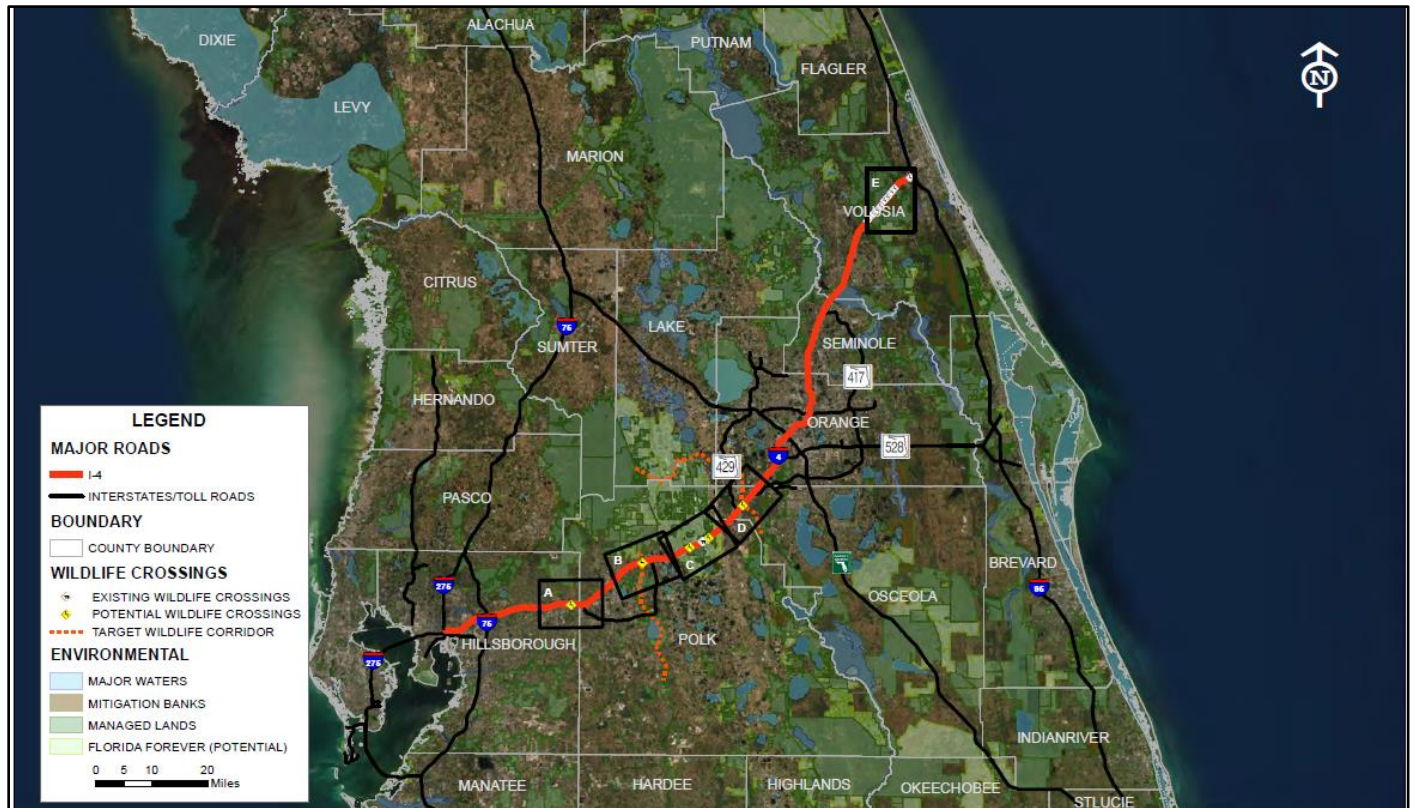
There have been additional studies showing least cost pathways in south Florida to give credence to probable movements of panthers across the landscape and across roadways.²¹ There have also been prior studies that examined areas of significant roadkill and opportunities to cure these problem areas through repurposing of adjacent or nearby culverts, bridges, or other structures.²²

²¹ Swanson, et al., 2008. Use of Least-Cost Pathways to Identify Key Road Segments for Florida Panther Conservation. Fish and Wildlife Research Institute Technical Report.

²² Smith, Noss, and Main, 2006. East Collier County Wildlife Movement Study SR29, CR846, and CR858 Wildlife Crossing Project.

Permeability at Interstate 4 in Central Florida and Beyond

The Panther Recovery Implementation Team Transportation Subteam produced a report in 2020²³ that shows remaining areas for large mammal permeability at I-4. This report depicts the extremely limited locations at I-4 where connections are still possible, as seen in the map below. Connectivity beyond this barrier is necessary for future expansion of the Florida panther breeding range.

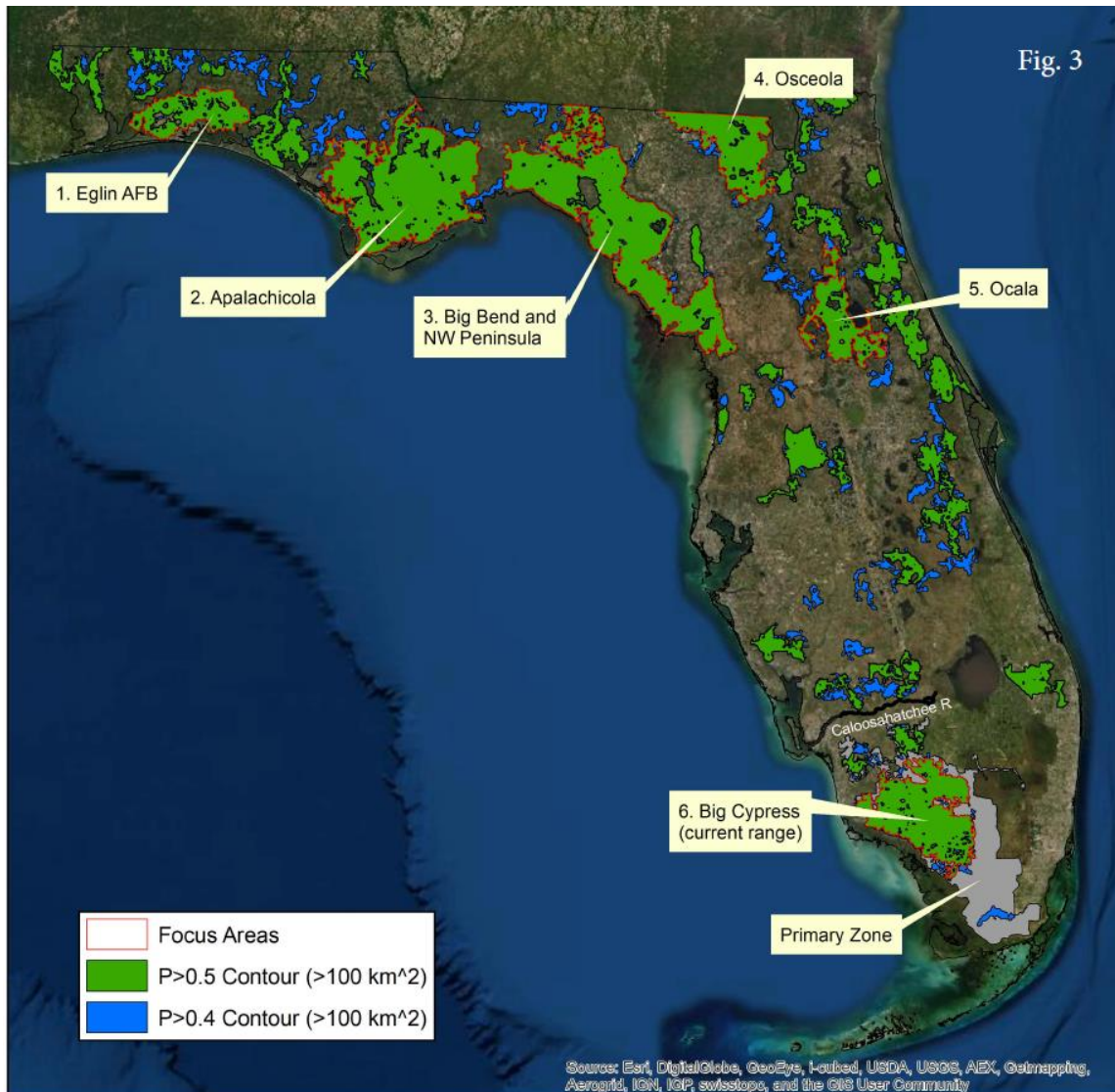


The current areas for connection include east Hillsborough County, Saddle Creek near the Tenoroc Public Use Area, Green Swamp and Hilochee Wildlife Management Area, Reedy Creek, and Tiger Bay State Forest area in Volusia County.

Ultimately, Florida panther access and use of corridors well into central and north Florida will be necessary for recovery of the species, and lands in the Big Bend and panhandle contain large tracts of lands that would be of high value to the panther, as seen below.²⁴

²³ Florida Panther Recovery Implementation Team Transportation Subteam, 2020. Wildlife Permeability along Interstate 4. Transportation Subteam report to Florida Panther Recovery Implementation Core Team and US Fish and Wildlife Service. June 2020. https://conservancy.org/wp-content/uploads/2022/03/I-4-Wildlife-Permeability-report_final.pdf

²⁴ Frakes & Knight, 2021. Location and extent of unoccupied panther habitat in Florida: opportunities for recovery. Global Ecology and Conservation, Vol. 26, April 2021, e01516.



Conclusion

In order for the panther to survive and recover, connected corridors and safe passage at roadways must exist. We hope this paper provides a framework to consider and prioritize specific land acquisitions and installation of large mammal crossing structures that will help create a viable corridor needed to save the endangered Florida panther.