

FLORIDA

AGRICULTURE 2040 2070



Agriculture and the lands that support it provide an integral contribution to Florida's economy, culture, and quality of life. In addition to its statewide economic impact, Florida's working agricultural land also supports local and regional economies based on agriculture and ecotourism and protects our state's rural quality of life.

The importance of agriculture to the state's economic health cannot be overstated. According to the University of Florida Institute of Food and Agricultural Science (IFAS), the direct economic contributions of the agriculture, natural resource, and food industries in 2019 included \$106 billion in sales and 1,279,638 jobs.

In addition to the economic values it provides, maintaining Florida's agricultural production and lands is also essential to sustain and improve food security and nutrition security and ecosystem service delivery for us and future generations dependent on the bounty of Florida's lands. This is especially critical in a time when our changing climate brings increasing challenges to agriculture.

SEA LEVEL 2040/2070

Sea Level 2040/2070, developed as part of 2023's *Florida's Rising Seas: Mapping Our Future*, is a GIS-based analysis focusing on the intersection between population growth, development patterns, and sea level rise in Florida. The 2040 and 2070 studies each include a baseline and two future scenarios. The Sprawl Scenario for each assumes that current patterns of development continue, and all conservation lands are open for development. The Conservation Scenarios assume that priority natural lands will not be developed, and that future development will be more compact. Find out more at Appendix A or 1000fof.org/sealevel2040.

A joint project of . . .



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1000fof.org/ag2040-2070

Iconic landscapes – vast ranchlands, forests, citrus groves, crop fields, and more – are a familiar sight to those who venture away from urban areas. They reflect a rich tradition of generations of farmers working the land, as do the small towns that dot the rural landscape and support local economies. These landscapes continue to play a vital role in Florida’s quality of life.

There is a close and mutually dependent relationship between Florida’s agricultural and conservation land which, in many cases, overlap. They both provide important ecosystem services with quantifiable economic value, including protecting water supply and quality, providing flood control, supporting climate resilience, sequestering carbon, enhancing biodiversity, harboring wildlife, promoting outdoor recreation, contributing aesthetic value, and more.

Roughly a third of Florida’s 36.6 million acres of land remain in agriculture today, including silviculture, ranching, citrus, field crops, nurseries, and other commodities. But as Florida continues to face unrelenting population growth and sea level rise, agricultural land is increasingly threatened. Of Florida’s 12 million acres of agricultural land, currently only about 1.9 million acres – or 15.8% – have been protected from development through federal, state, local and private land conservation programs.

Impacts of Fragmentation

Compounding the outright loss of agricultural land, the resulting creation of fragmented parcels makes the landscape less viable for current agricultural uses and future opportunities. When agriculture loses “critical mass,” not only is the future of agriculture impaired but the impacts ripple through the regional economy. Farm equipment dealers close if they do not have enough clients, seed suppliers shutter, and more. This in turn makes the remaining agriculture less viable, resulting in cascading fragmentation to point of no return. The conversion of agricultural land to sprawling subdivisions and strip malls leaves remaining agricultural land and the ecosystem services they provide increasingly vulnerable, fragmented, and often degraded.

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Under the GIS-based *Florida's Rising Seas* Sea Level 2070 Sprawl Scenario, between now and 2070 Florida could add more than 12 million more residents. Using more refined agricultural data than earlier studies, this could result in the loss of approximately 3.5 million acres of land to development, including approximately 2.2 million acres of agricultural land. This breaks down to approximately 250 acres of land a day (or 90,000 acres of land a year), including 120 acres of agricultural land a day or almost 45,000 acres a year.

Agriculture 2040/2070 is intended to provide a more detailed understanding of the impacts of population growth, development patterns, and sea level rise on Florida's agricultural lands and their many conservation and other values, significantly expanding upon the results of 2023's *Sea Level 2040/2070*. Recommendations, starting on page 33, include robust funding, sound community planning, science-based decision-making, and market-based solutions to sustain Florida's agricultural lands and their conservation values for generations to come. Both this and the *Sea Level 2040/2070* analyses are joint projects of the University of Florida Center for Landscape Conservation Planning and 1000 Friends of Florida.



*Agriculture 2040/2070 relies on more comprehensive data and includes silviculture as agriculture, so some figures related to agriculture and other land differ significantly from those in *Sea Level 2040/2070*. For more information on *Sea Level 2040/2070*, please see Appendix A or 1000fof.org/sealevel2040.*

Population Growth

- ⤴ By 2040, a 23% increase in population, with 4.9 million more residents than 2019
- ⤴ By 2070, a 57% increase in population, with 12.2 million more residents than 2019

Sea Level Rise

- ⤵ By 2040, 1 million acres of land lost to inundation, including almost 7,500 acres of agricultural land
- ⤵ By 2070, 1.7 million acres of land lost to inundation, including 41,000 acres of agricultural land

Sprawl Scenario

- ⤴ By 2040, nearly 1 million more acres of developed land, an increase of 17%
- ⤴ By 2070, nearly 3.5 million more acres of developed land, an increase of 64%
- ⤵ By 2040, approximately 523,000 acres of agricultural lands lost to development
- ⤵ By 2070, more than 2.2 million acres of agricultural land lost to development
- ⤵ By 2040, 206,000 acres in the Florida Wildlife Corridor (Corridor) lost
- ⤵ By 2070, 1.2 million acres in the Corridor lost

Conservation Scenario

(compared with Sprawl Scenario):

- ⤴ 5 million more acres of proposed protected natural land (including the Corridor)
- ⤴ 2.4 million more acres of proposed protected agricultural land (including the Corridor)
- ⤵ By 2040, 270,000 fewer acres of developed land, a saving of about 4%
- ⤵ By 2070, 1.3 million fewer acres of developed land, a saving of about 14%

continued

Florida Statewide Results

Agriculture 2040/2070 includes more refined data and analyses compared to the earlier *Sea Level 2040/2070*. It identifies a higher total of agricultural lands than in this earlier study because the current analysis includes silviculture as agriculture and relies on more detailed data from the Florida Department of Agriculture and Consumer Services (FDACS) and other sources.

With these refined calculations, about 12 million acres – close to a third of Florida’s 36.6 million acres of land – is in agriculture. Approximately 40% of Florida’s agricultural land – close to 4.9 million acres – is in grazing, primarily in ranches in south-central and southwest Florida. Silviculture represents more than 37% of Florida’s agricultural lands – about 4.5 million acres – with the majority north of Orlando. “Other” includes row crops, groves, ornamentals, vegetables, and other crops, and encompasses 2.6 million acres, or roughly 22% of Florida’s agricultural land.

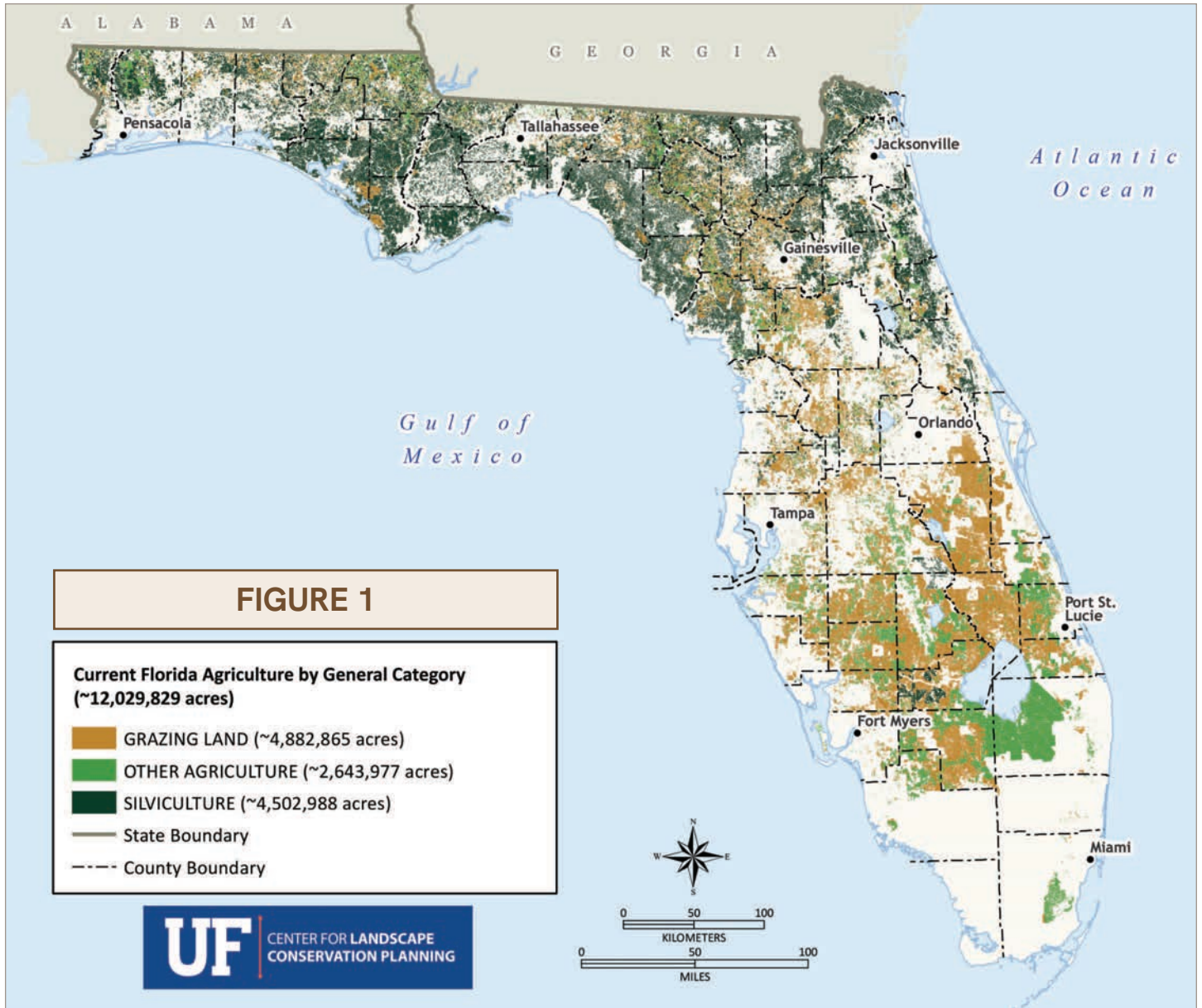
But as with other land categories, over the coming decades Florida’s agricultural lands will face increasing pressure from the loss of land associated with sea level rise and population growth.



Lightsey Ranch Aerial, 2006 by Carlton Ward Jr / Wildpath

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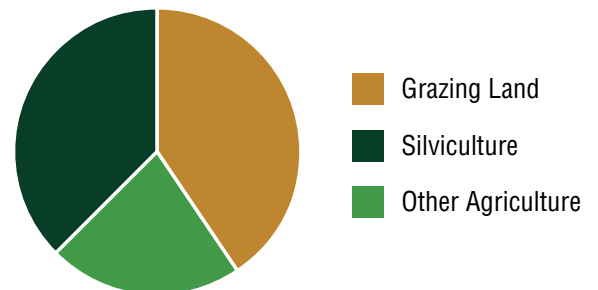
Current Florida Agriculture by General Category



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

TABLE 1

General Category	Acres	Percent
Grazing Land	4,882,865	40.6%
Other Agriculture	2,643,977	22.0%
Silviculture	4,502,988	37.4%
TOTAL	12,029,829	100.0%



continued

Impacts of Sea Level Rise on Agricultural Lands

According to the 2023 study, *Florida's Rising Seas: Mapping Our Future*, Florida is projected to lose significant land to inundation from sea level rise. By 2040, the loss of more than 1 million acres of land is projected, including 852,000 acres of protected conservation land, based on the 2022 NOAA intermediate projection of a 0.25-meter (almost 10-inch) rise in sea level. By 2070, it is anticipated that a total of 1.7 million acres of land will be lost when compared with 2014, including 1.4 million acres of protected conservation land. This is based on a modified version of the 2017 NOAA Intermediate-High projection that sea level will rise by 0.9 meters or close to 3 feet.

However, sea level rise is not projected to have a major direct impact on Florida's agricultural lands, with total land lost projected to be a relatively modest 41,000 acres by 2070. Silviculture lands in the Big Bend region of north Florida are projected to be most directly impacted by sea level rise, followed by grazing land, and a mix of agricultural uses in the St. Johns River watershed.

This analysis just includes direct inundation but does not consider the related impacts of saltwater intrusion (including increased storm surge) and the migration of wetlands further inland, nor other impacts stemming from our changing climate, including possible additional human migration inland that might not be captured in these scenarios.

Sea level rise will not just impact coastal areas, as certain inland coastal counties will also be affected. This is a result of increased water levels in inland water bodies that are hydrologically connected to the coast, with the St. Johns River being one example. This also does not factor in other inland flooding (such as within inland floodplains) likely to occur as a result of broader climate change impacts such as more frequent heavy rain events.



Flooded Pasture Near St. Johns River

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Projected Loss Under NOAA Three-Foot Sea Level Rise Model

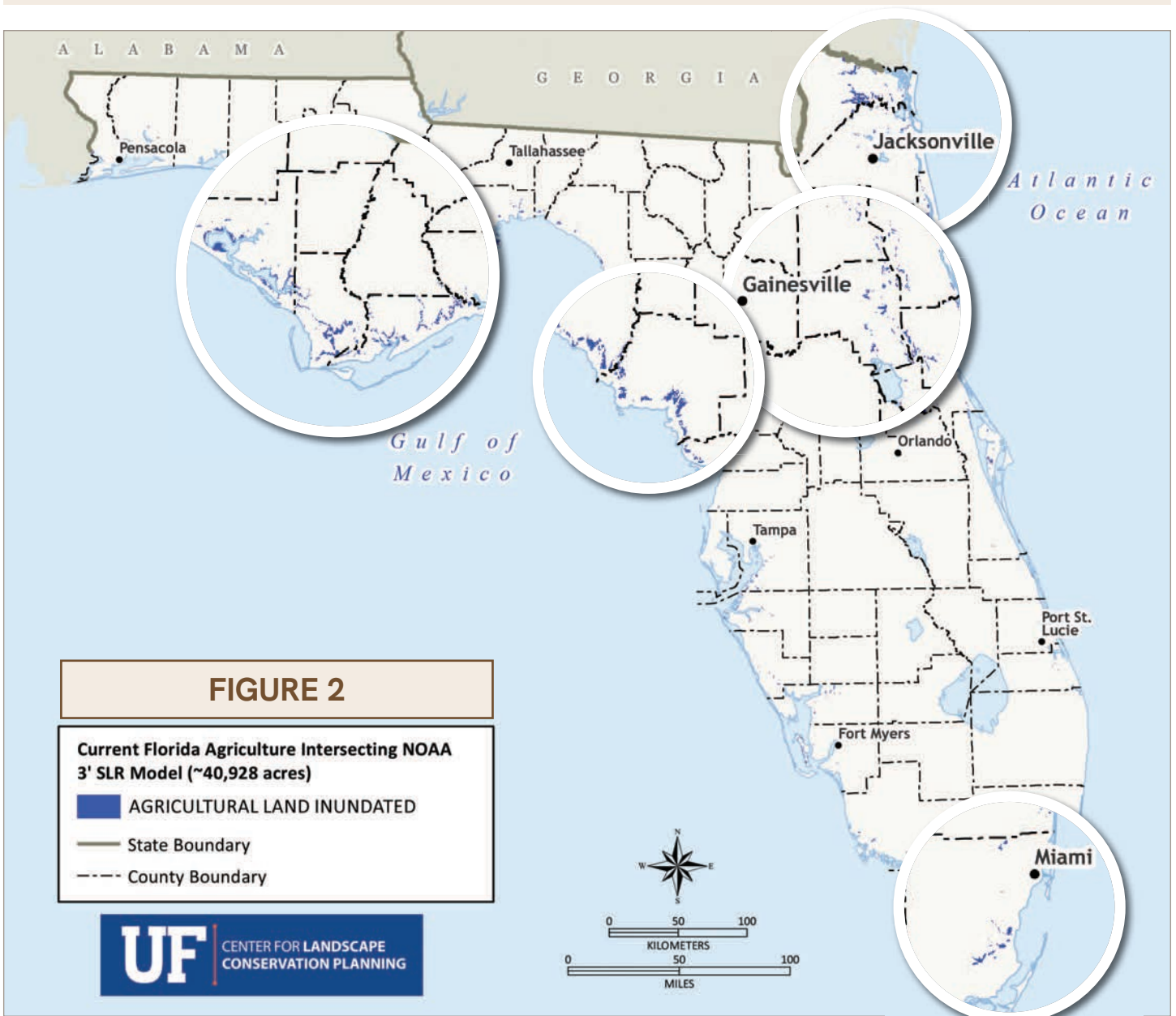
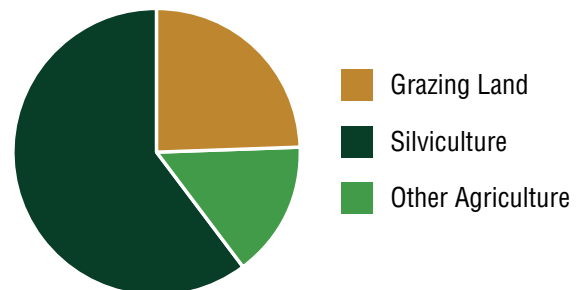


TABLE 2

General Category	Acres Lost	Percent
Grazing Land	10,083	24.6%
Other Agriculture	6,253	15.3%
Silviculture	24,592	60.1%
TOTAL	40,928	100.0%



continued

Impacts of Development on Agricultural Lands

Based on moderate projections by the Florida Bureau of Economic and Business Research (BEBR), it is assumed that Florida's population will increase 23% by 2040, with 4.9 million more residents than in 2019. By 2070, it is projected that Florida will experience a 57% increase in population over 2019, with 12.2 million more residents. This projected future growth and associated development will have a far more significant impact on agricultural lands than sea level rise.

As noted, as part of the *Sea Level 2040/2070* analyses, two future scenarios were explored. The Sprawl Scenario assumes that current patterns of development will continue, and unprotected priority natural land will all be available for development. The Conservation Scenario assumes that future development will be more compact and avoid priority natural land. Each scenario accounts for the projected loss of land due to sea level rise.

By 2040, Florida is projected to lose about 523,000 acres of agricultural land to development under the Sprawl Scenario. Assuming that development of priority natural lands is avoided, and new development is 30% more compact, the 2040 Conservation Scenario would save approximately 168,000 acres of agricultural land compared with the Sprawl Scenario.

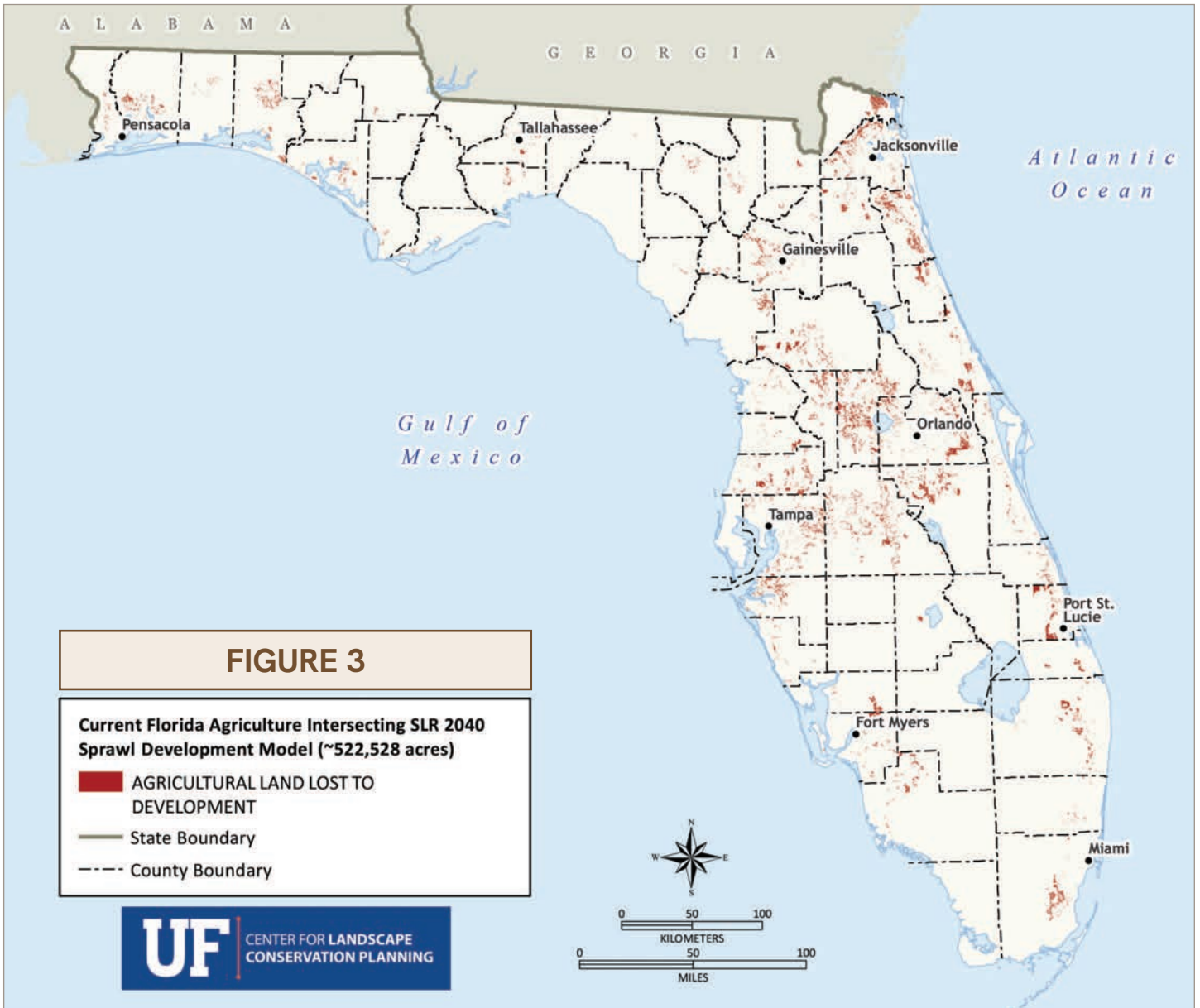
Grazing land is projected to be most impacted, with almost 250,000 acres, or 48% of the total land lost. Silviculture is next, with a loss of approximately 145,000 acres projected under the Sprawl Scenario, or more than 28% of the total land lost. Other agriculture is projected to lose 129,000 acres, or almost 25% of the total. Less current agricultural land is projected to be lost under the Conservation Scenario, with grazing dropping to a loss of about 174,000 acres, silviculture to 85,000 acres, and other to 95,000 acres.

Under the 2070 Sprawl Scenario, assuming current patterns of development continue, Florida is projected to lose more than 2.2 million acres of agricultural land to development. Grazing land primarily associated with ranches is projected to be most impacted, with more than 1 million acres lost. Other agriculture is second, with a projected loss of approximately 723,000 acres, and silviculture third, with 490,000 acres projected to be lost.

The 2070 Conservation Scenario – which assumes that development of priority natural lands is avoided, new development is 20% more compact, and some redevelopment occurs – would result in saving close to 850,000 acres of agricultural land from development. Approximately 334,000 fewer acres of grazing land, 324,000 acres of “other,” and 190,000 acres of silviculture are projected to be developed under this scenario.

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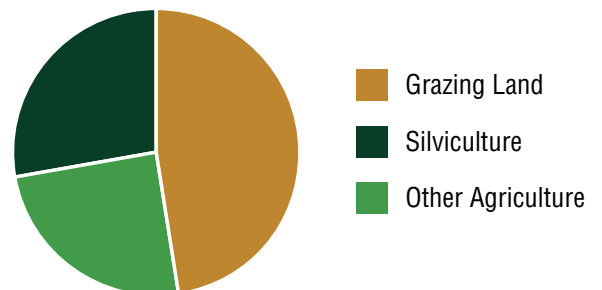
Projected Loss to Development Under 2040 Sprawl Scenario



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

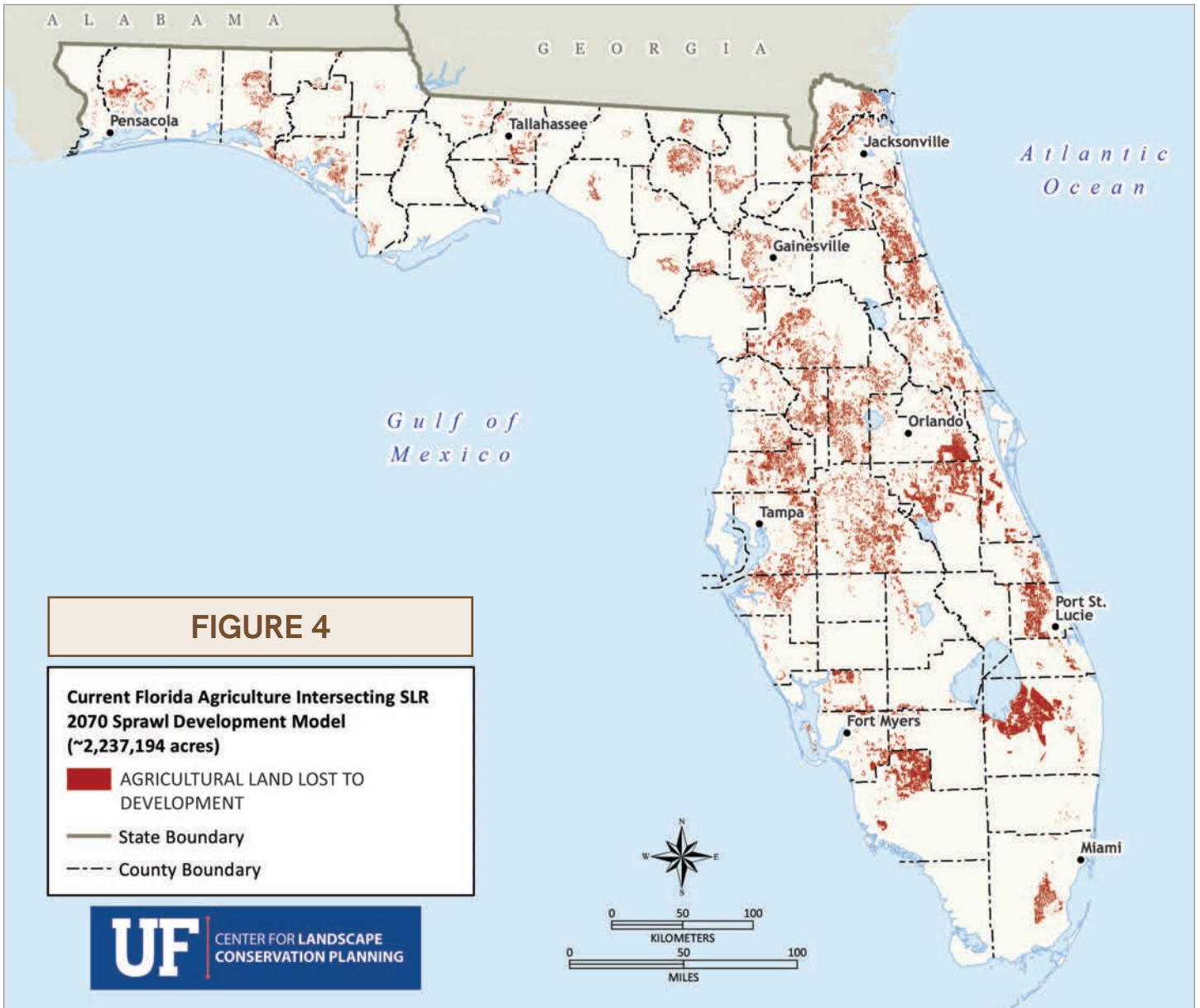
TABLE 3

General Category	Acres Lost	Percent
Grazing Land	249,378	47.7%
Other Agriculture	128,653	24.6%
Silviculture	144,497	27.7%
TOTAL	522,528	100.0%



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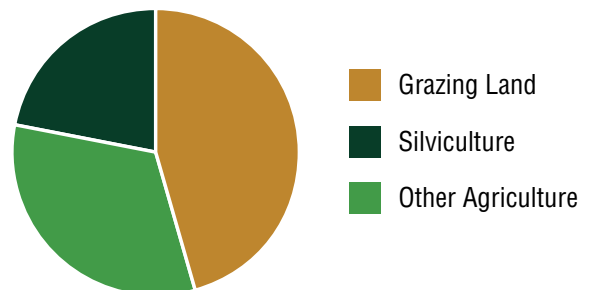
Projected Loss to Development Under 2070 Sprawl Scenario



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

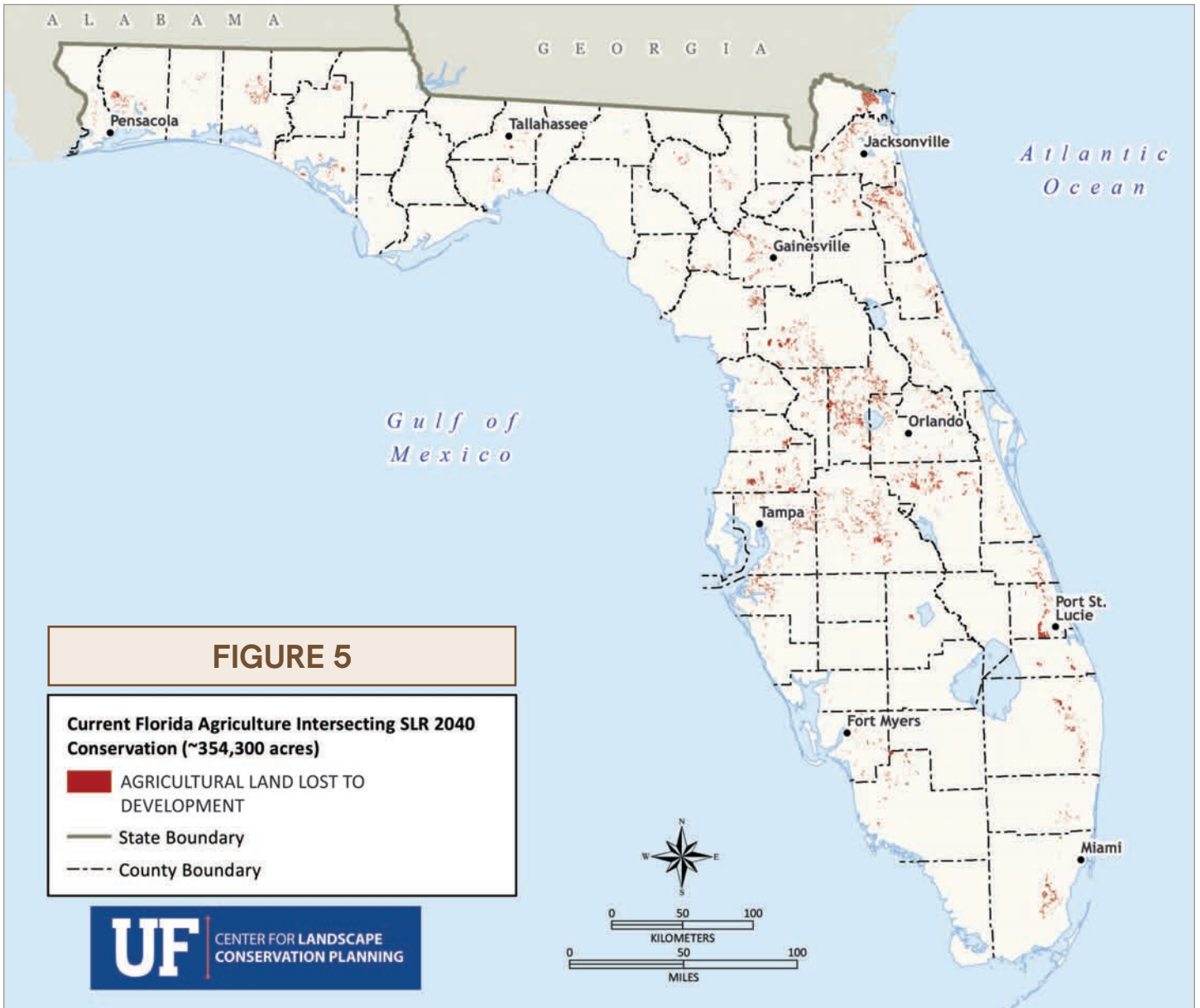
TABLE 4

General Category	Acres Lost	Percent
Grazing Land	1,024,311	45.8%
Other Agriculture	722,702	32.3%
Silviculture	490,181	21.9%
TOTAL	2,237,194	100.0%



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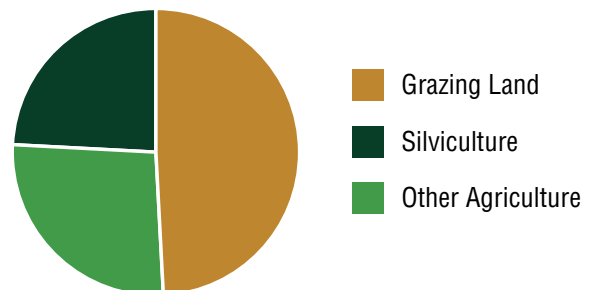
Projected Loss to Development Under 2040 Conservation Scenario



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

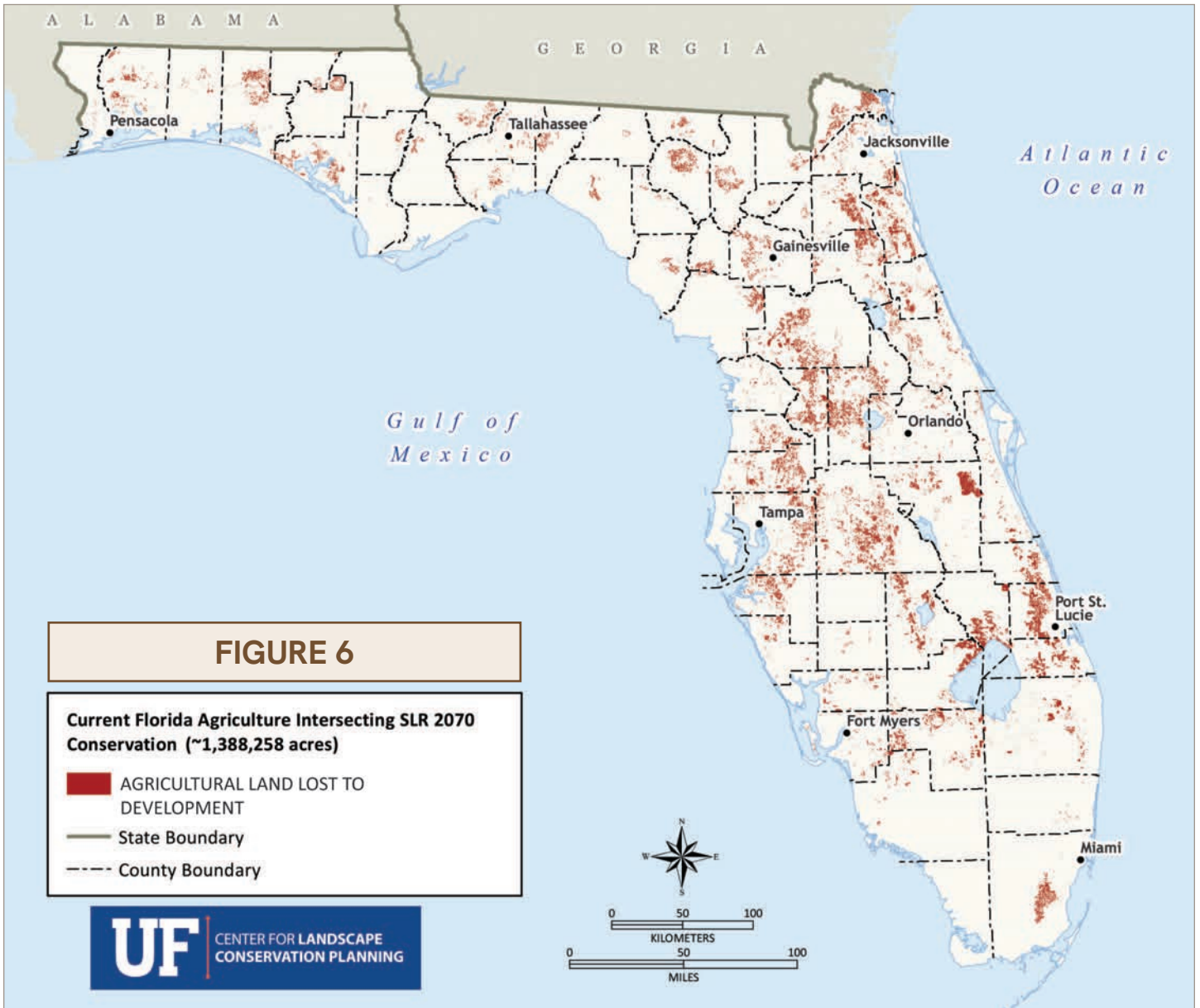
TABLE 5

General Category	Acres Lost	Percent
Grazing Land	174,311	49.2%
Other Agriculture	94,579	26.7%
Silviculture	85,409	24.1%
TOTAL	354,299	100.0%



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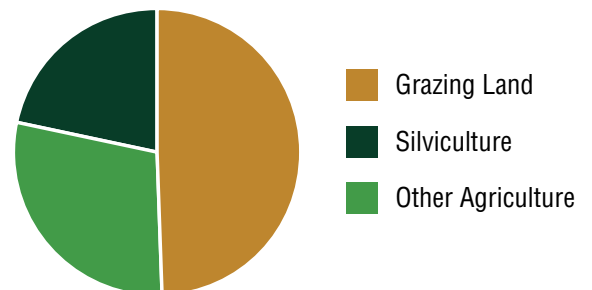
Projected Loss to Development Under Conservation 2070 Scenario



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

TABLE 6

General Category	Acres Lost	Percent
Grazing Land	690,056	49.7%
Other Agriculture	398,227	28.7%
Silviculture	299,975	21.6%
TOTAL	1,388,258	100.0%



continued

Current Agriculture and Future Land Use Maps (FLUM)

Of particular interest to planners, when comparing current agriculture with statewide Future Land Use Map (FLUM) data, only about 58% of current agricultural lands are actually designated as agricultural in FLUMs. More than 2 million acres of current agriculture have non-agricultural FLUM designations, including Mixed Use (32%), Industrial (17%), and Residential (17%). This reflects a significant disconnect between local government FLUMs and existing agriculture, potentially accelerating the development potential of some agricultural land.

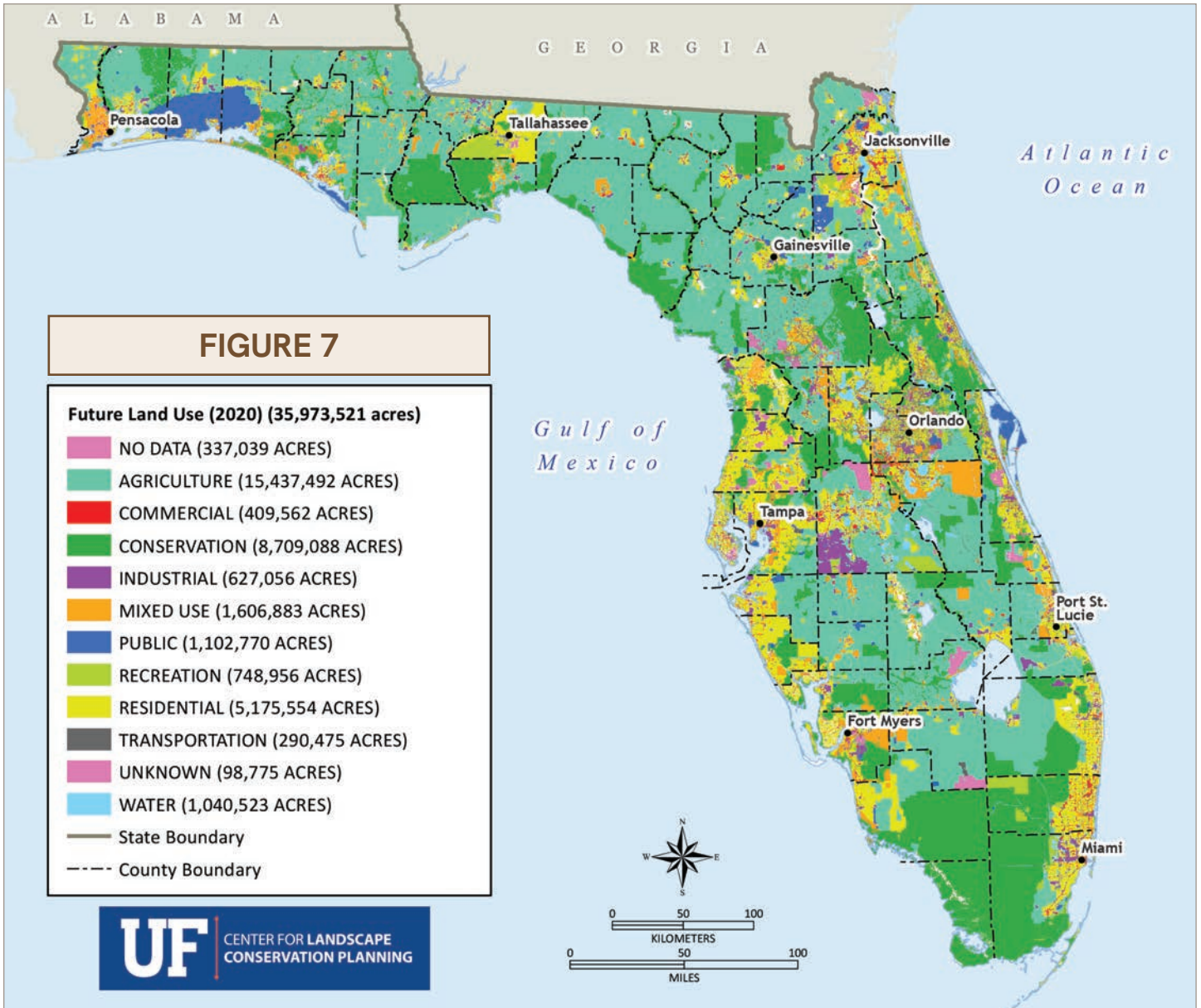
One potential way to acknowledge and address this disconnect is to encourage counties to include an optional agricultural element in their comprehensive plans with goals, objectives, and policies to better protect agricultural land from development, limit fragmentation, and support rural economies. In addition, counties can designate a farmland overlay and incorporate it into their FLUM, as has been done in Marion County. Additionally, local governments should carefully evaluate proposals that convert land designated as "agricultural" to non-agricultural categories in the FLUM.



Marion County's Farmland Preservation Area by Vivian Young, AICP

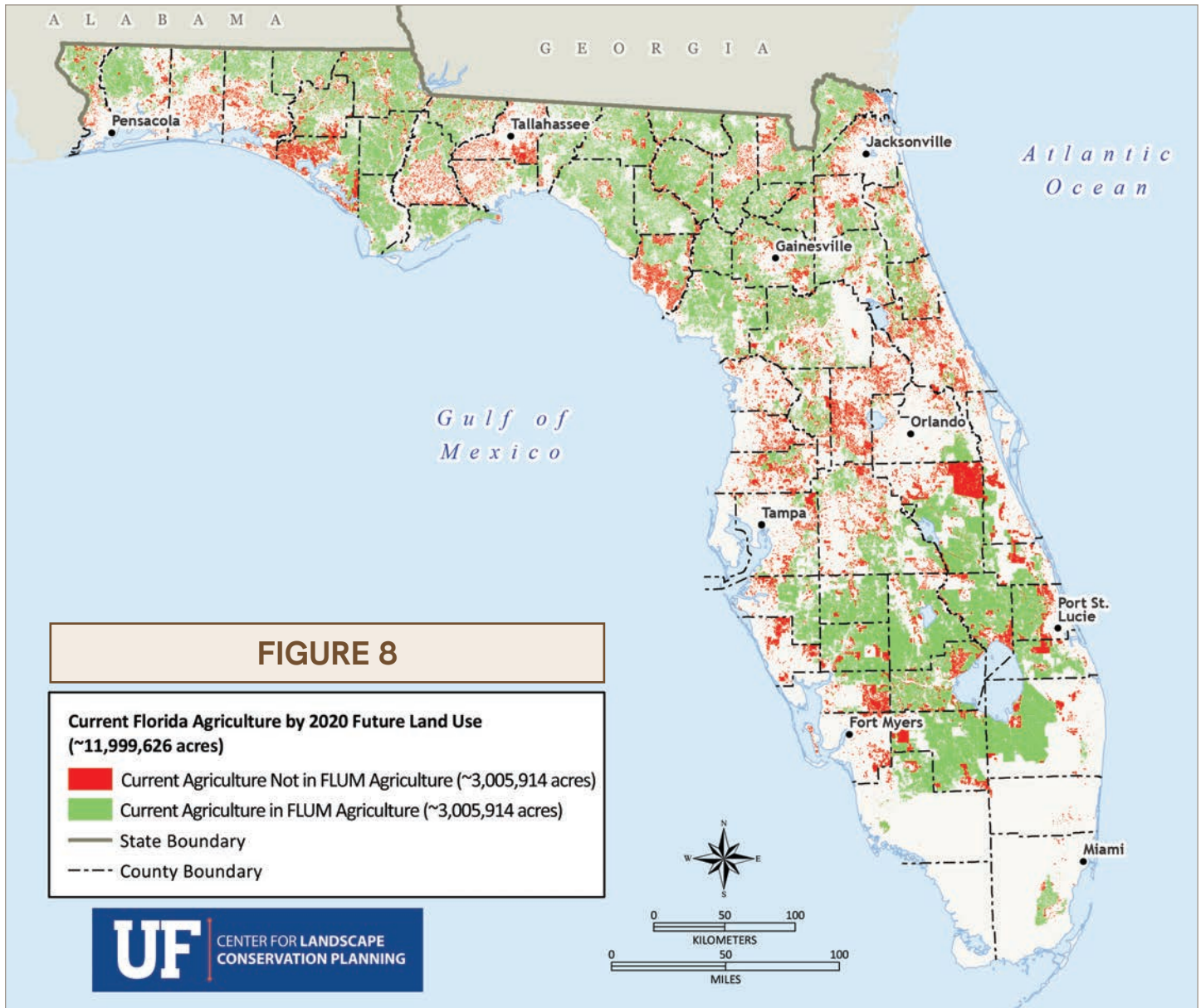
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2020 Florida Future Land Use Maps



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

Current Florida Agriculture Classified As Non-Agricultural or Agricultural in 2020 Future Land Use Maps (FLUM)



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

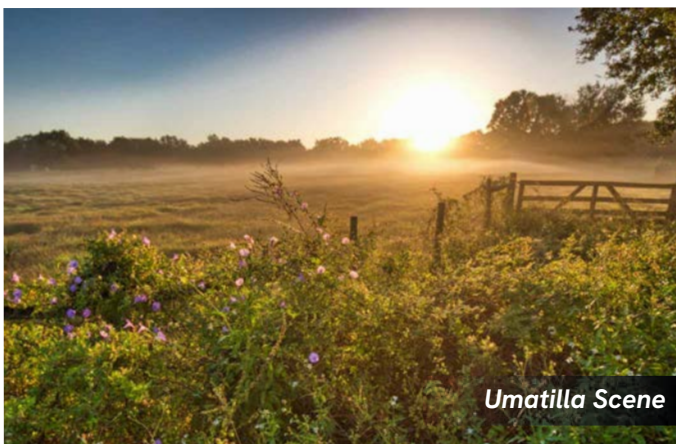
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The Intersection Between Agricultural and Conservation Priorities

As noted earlier, it is important to understand the close and mutually dependent relationship between agricultural and priority conservation areas in Florida. This is reflected in a series of state GIS-based databases and programs, described more fully in Appendix B. This section briefly discusses the overlap between current agricultural lands and conservation priority natural land including the Critical Lands and Waters Identification Project (CLIP), the Florida Ecological Greenways Network (FEGN), and the Florida Wildlife Corridor (Corridor).

TABLE 6
Current Florida Agriculture in Statewide Conservation GIS Databases

Summary Statistics for Agriculture and Conservation Priorities		
Element	Acres	Percent of Total
Current Florida Agriculture	12,029,829	NA
Grazing Land	4,822,865	40.1%
Other Agriculture	2,643,977	22.0%
Silviculture	4,502,988	37.4%
Florida Ecological Greenways Network	23,096,916	NA
In Current Florida Agriculture	7,825,482	33.9%
Florida Wildlife Corridor	17,677,290	NA
In Current Florida Agriculture	5,813,682	32.9%
CLIP 4.0 Priority Classes 1-3	29,292,690	NA
In Current Florida Agriculture	8,021,685	27.4%
State Land-Protection Projects	4,121,948	NA
In Current Florida Agriculture	1,856,728	45.0%



Umatilla Scene

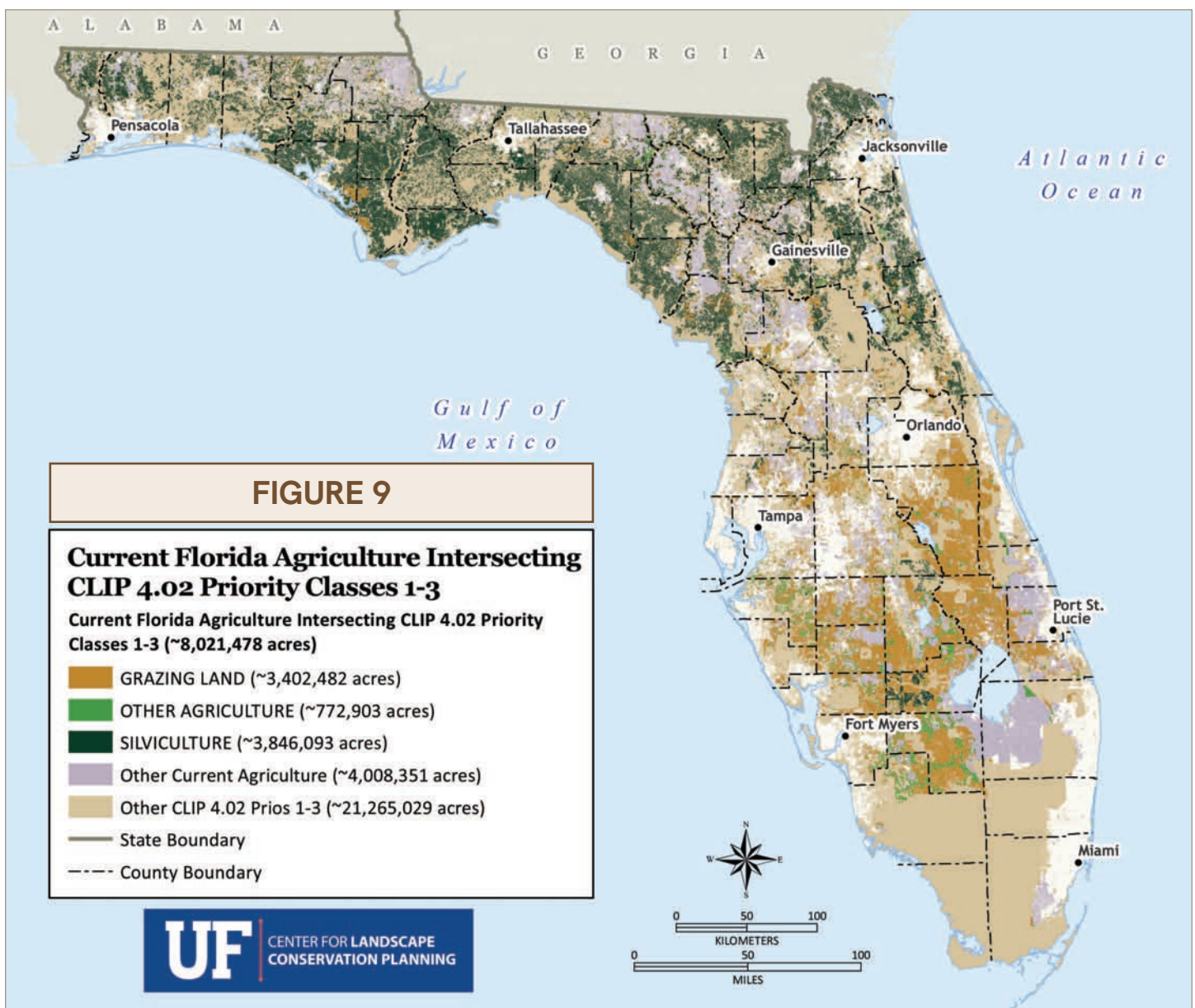


A Threatened Landscape by Vivian Young, AICP

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The Critical Lands and Waters Identification Project (CLIP) is a statewide GIS database of priority land and water with conservation values related to biodiversity, landscape function, surface water, groundwater, and aggregated conservation priorities. Priority 1 is the most important from an ecological perspective, with Priority 5 the least. The CLIP Technical Advisory Group has identified the CLIP Aggregated Priorities P1-P3 to all be more significant for conservation efforts. Approximately 8 million acres (27.5%) of CLIP 4.02 priority classes 1-3 overlap with agricultural lands. This is particularly true in the silvicultural lands of the Apalachicola River watershed and Big Bend in North Florida, and in the ranches of south-central and southwest Florida.

Current Florida Agriculture in CLIP 4.02 Priority Classes 1-3

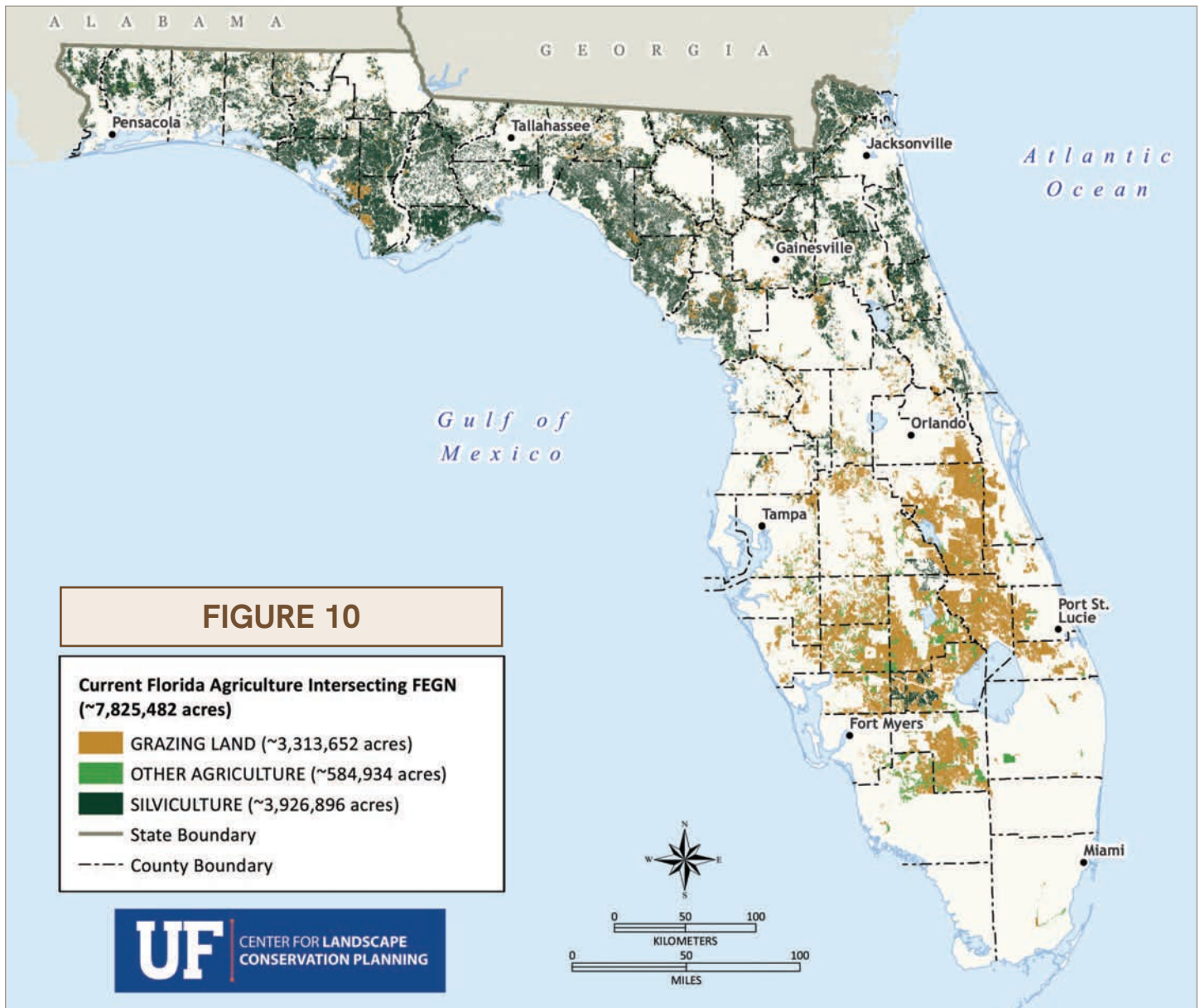


Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

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The Florida Ecological Greenways Network (FEGN) is another statewide GIS database used for planning related to conservation of biodiversity and ecosystem services. It includes 5 priority levels with Priority 1 including the most critical linkages. The FEGN “identifies and prioritizes a functionally connected statewide ecological network of public and private conservation lands” across the state. Close to 8 million acres of current agricultural lands are included in the FEGN; grazing land in the peninsula and silviculture in north Florida are most prominent. Other forms of agriculture (including row crops and citrus) support the FEGN in southwest Florida.

Current Florida Agriculture in the Florida Ecological Greenways Network

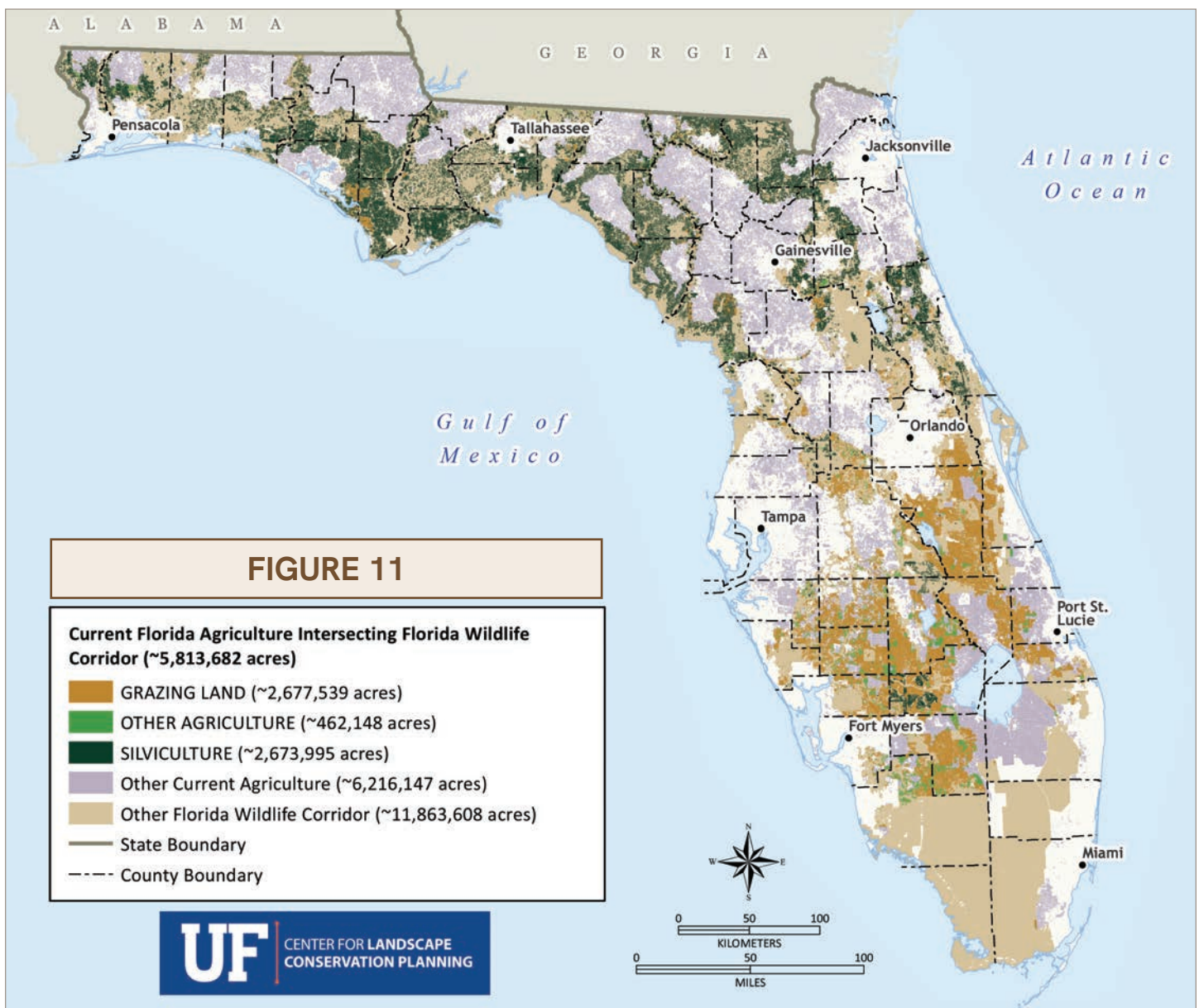


Date: 1/2024. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

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An FEGN subset including Priorities 1, 2, and 3 comprise the **Florida Wildlife Corridor (Corridor)**. About one-third (5.8 million acres) of the Corridor’s 18 million acres is currently in agriculture. Currently 9.8 million acres of land in the corridor are protected, including approximately 1.7 million acres of agricultural land. This overlap is particularly prominent in the northwest, north-central, south-central parts of the state. Funding to protect land in the Corridor – through conservation easements and acquisition primarily through the Florida Forever and Rural and Family Lands Protection Program – has been a state legislative priority in recent years. Under the Sea Level 2040/2070 and Agriculture 2040/2070 Sprawl Scenarios, approximately 206,000 acres of Corridor land are projected to be lost to development by 2040, rising to 1.2 million acres lost by 2070. The Conservation Scenarios are based on the assumption that development does not occur on priority conservation lands, including those in the Corridor.

Current Florida Agriculture in the Florida Wildlife Corridor



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

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Ecosystem Services Provided By Florida's Agricultural Land

Florida's agricultural and conservation lands in many cases overlap. Together, they provide important ecosystem services with quantifiable economic value, including protecting water supply and quality, providing flood control, supporting climate resilience, sequestering carbon, harboring wildlife, promoting outdoor recreation, and more.

In addition to evaluating the impact of population growth, development patterns, and sea level rise on Florida's agricultural land, the Center for Landscape Conservation Planning also examined the importance of agricultural land for supporting Florida's ecosystem services and biodiversity.

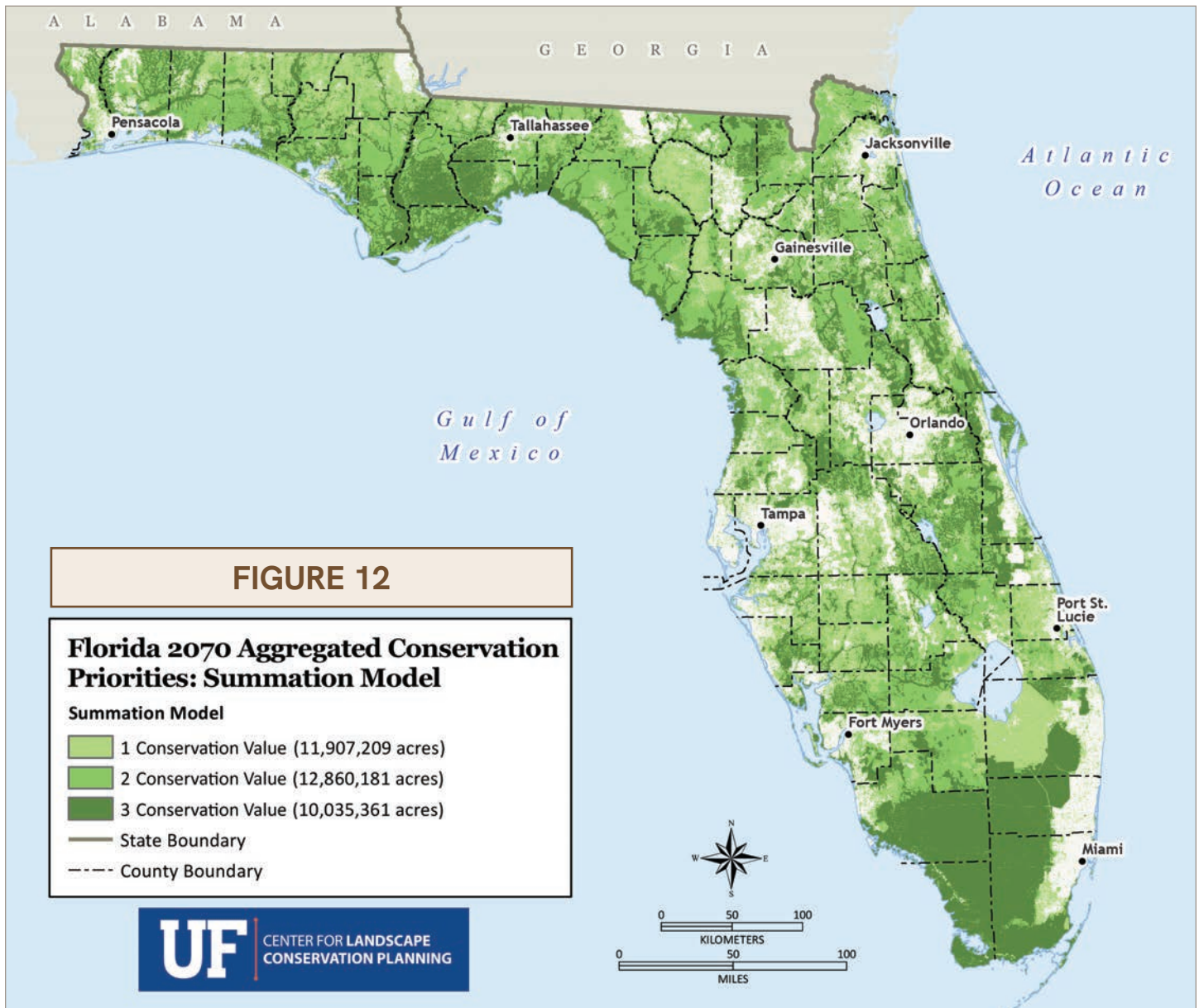
Compiling spatial information from multiple conservation priority datasets, the Center determined that more than 33 million of Florida's acres have some conservation value, including water-related services such as supporting wetland function, surface water quality, and protecting floodplains.



Suwannee Delta II by Carlton Ward Jr / Wildpath

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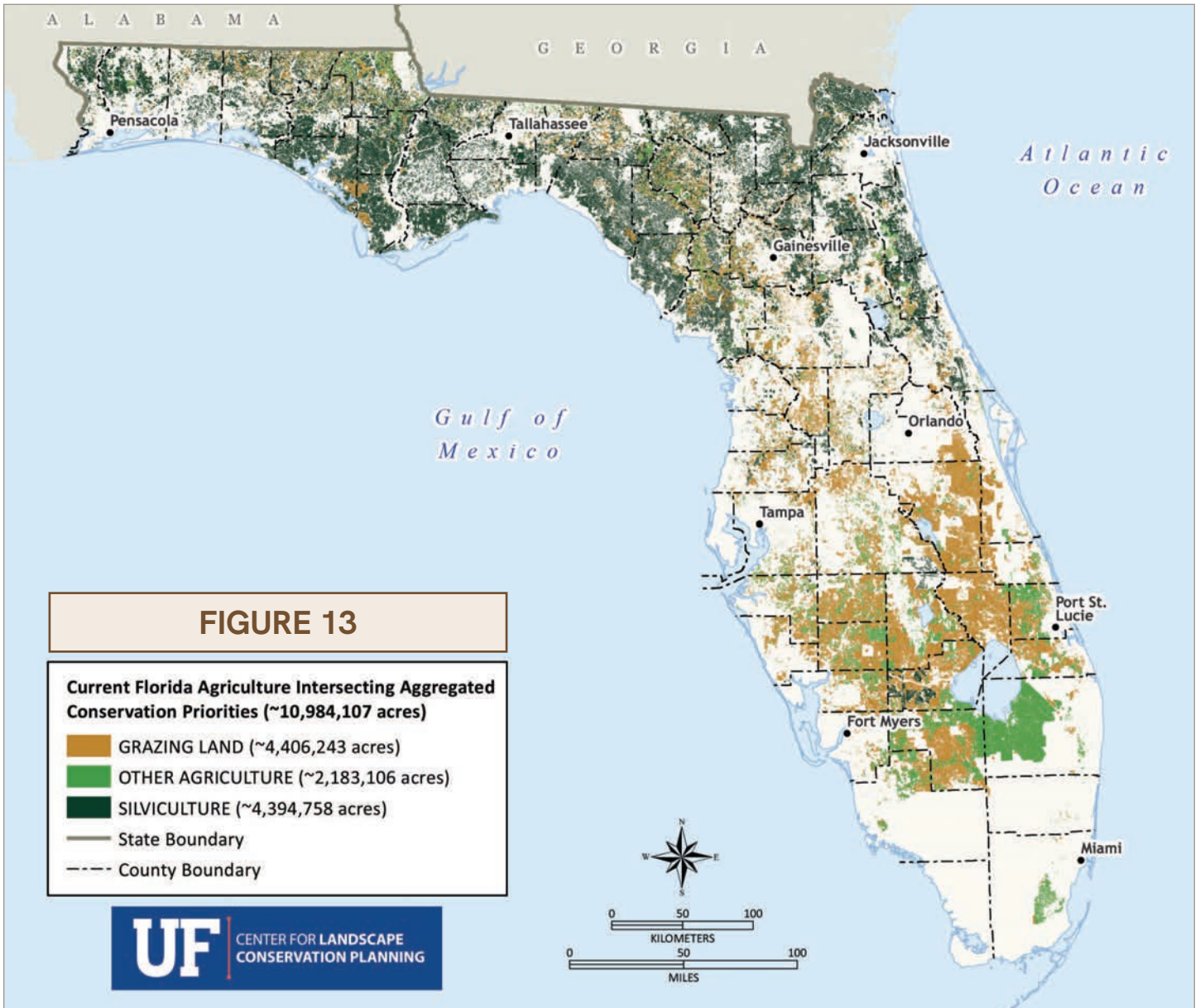
Current Florida Agriculture in 2070 Aggregated Conservation Priorities



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey, Projection: Albers Conical Equal Area

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Current Florida Agriculture Intersecting Aggregated Conservation Priorities



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

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Water Supply, Water Quality and Flood Control

Agricultural land stores and cleanses Florida's water, playing a major role in both water supply and water quality. Agriculture supports surface water quality in Florida, with 1.3 million acres of CLIP Priority 1 and 2 Significant Surface Waters on agricultural land. Silviculture was found to support surface water quality in north Florida, with ranchlands and other agriculture performing a similar function on the peninsula.

Significant wetlands and floodplains occur on agricultural properties, which provide water quality filtration and flood storage services. Approximately 3.4 million acres of Florida's agricultural land is in floodplains. About 36% – or 13 million acres – of Florida's land is wetlands, with about 8.5% or more than a million acres of Florida's wetlands on agricultural land (most agricultural lands are a mosaic of cultivated land and natural lands including wetlands). Wetlands provide multiple services including large-scale water storage and purification, flood control, and cleansing of our drinking water.

Florida also has approximately 3.8 million acres of potentially restorable former wetlands, including more than 2.5 million acres on agricultural land. Potential wetlands include undeveloped land that was likely wetlands before human intervention, when draining and conversion occurred on lands prior to the environmental era beginning in the 1970s.

These “potential wetlands” are roughly identified to include hydric soils that are not currently in wetlands or development. This is an overestimate of former wetlands but provides an estimate of the potential for wetland restoration, rehydration, and dispersed water storage that has the potential to significantly increase water quality and flood storage as well as provide restored habitat for wetland-dependent species. Potential wetlands can provide large-scale water storage, an important tool for reducing the frequency and severity of floods, which have become more likely with climate change.



Wetland slough with wading birds on Blackbeard's Ranch by Thomas Hctor

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Poorly managed agricultural lands can also contribute to water quality issues, along with urban stormwater, lawn fertilizers, septic tanks, and other sources of point and non-point source pollution. More management of agricultural land with best management practices (BMPs) can conserve water and reduce the amount of nutrients entering waterways from pesticides, fertilizers, animal waste and other pollutants. Florida's Basin Management Action Plans (BMAPs) are intended to identify sources of pollution, and include strategies to reduce the pollutants, monitor progress, and estimate restoration costs. One strategy relevant to landscape-scale conservation and watershed restoration is to identify wetland restoration opportunities in impaired basins including on agricultural properties.

Complementing this, Artificial Intelligence (AI) is bringing significant innovations to agriculture. Precision farming involves using the latest technology, including GPS, robots, drones, and sensors, to reduce the amount of energy, fertilizer, and water used on agricultural land while increasing productivity. It can also help farmers better adapt to climate change. Expanding awareness of and access to these cutting-edge but often costly tools will benefit both agriculture and the environment.

Wildlife Habitat

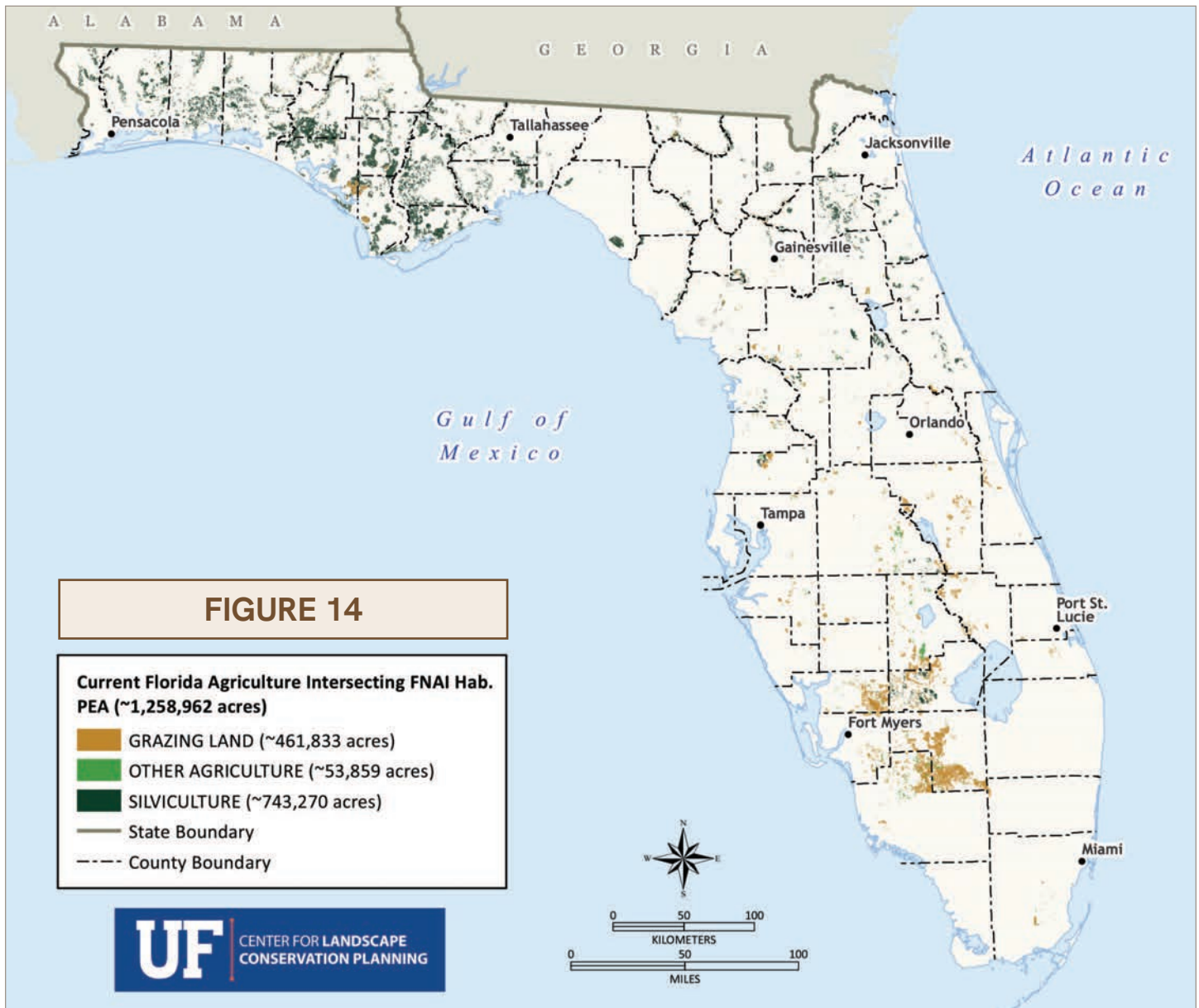
While Florida's agricultural lands are not pristine, they often provide important habitat for many focal species important for conservation. Though restoration to natural conditions is a goal for some lands including returning fire management to fire dependent ecosystems, limiting the conversion of agricultural lands to development is another important goal to protect important habitat. In many cases, silvicultural and grazing land uses provide habitat for wide-ranging, fragmentation-sensitive, and rural landscape dependent species that are declining or disappearing from landscapes converted to suburban or urban uses.

Current Florida agriculture overlaps considerably with lands important for the protection of Florida panthers and black bears. Approximately 4.3 million acres of Florida black bear priority ecological areas coincide with current agriculture, including 3.2 million acres in silviculture. Priority ecological areas for the Florida panther share approximately 4.6 million acres with current agriculture, including significant silvicultural and grazing acreage.

Current agriculture also shares millions of acres with other rare species habitat. Florida Natural Areas Inventory's Rare Species Habitat priority ecological areas include 1.3 million acres of current agriculture. These overlaps are particularly prominent in the Panhandle and in southwest Florida. Likewise, the Florida Fish and Wildlife Conservation Commission's Strategic Habitat Conservation Area priority ecological areas contain approximately 5 million acres of current agriculture.

continued

Current Florida Agriculture Intersecting Florida Natural Areas Inventory (FNAI) Rare Species Habitat



Date: 10/2023. Data: Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

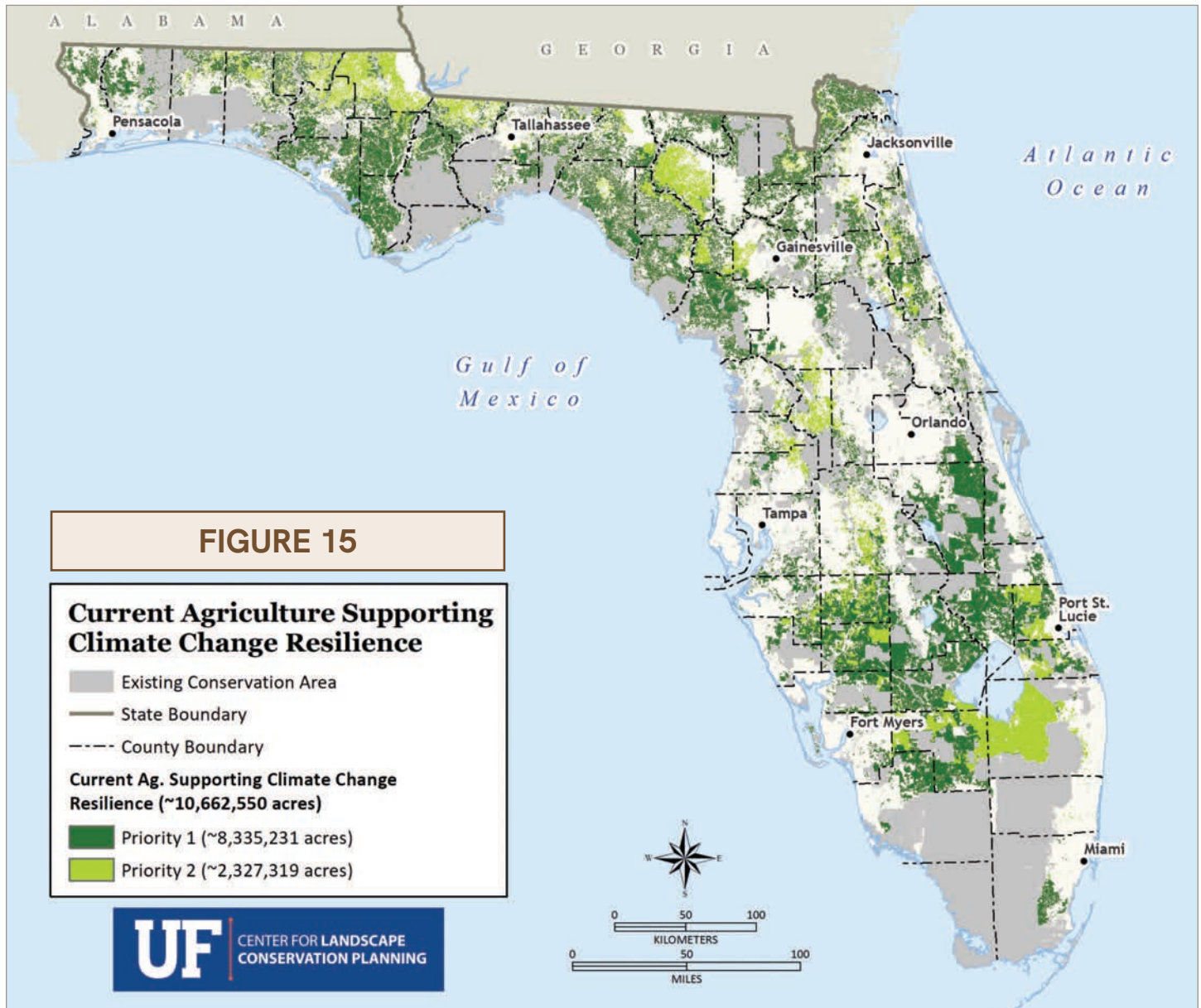
Climate Resilience

As part of its analysis, the Center for Landscape Conservation Planning evaluated existing agriculture for potential contributions to climate-change resilience. Contributions include the facilitation of biotic migration (either inland or northward) brought about by changing temperatures, hydrology, or other impacts. They also could include protection of important coastal waterbodies that support coastal wetlands which, in turn, support community resilience.

continued

To determine potential resilience contributions, the Center identified agricultural lands in coastal-to-inland ecological connectivity priority areas, wildlife corridors in the Florida Ecological Greenways Network (and Florida Wildlife Corridor), and watersheds discharging into sensitive coastal waterbodies. This identified about 10.7 million acres of Florida’s agricultural land (about 86%) that could play a significant role in supporting climate resilience.

Current Agriculture Supporting Climate Change Resilience



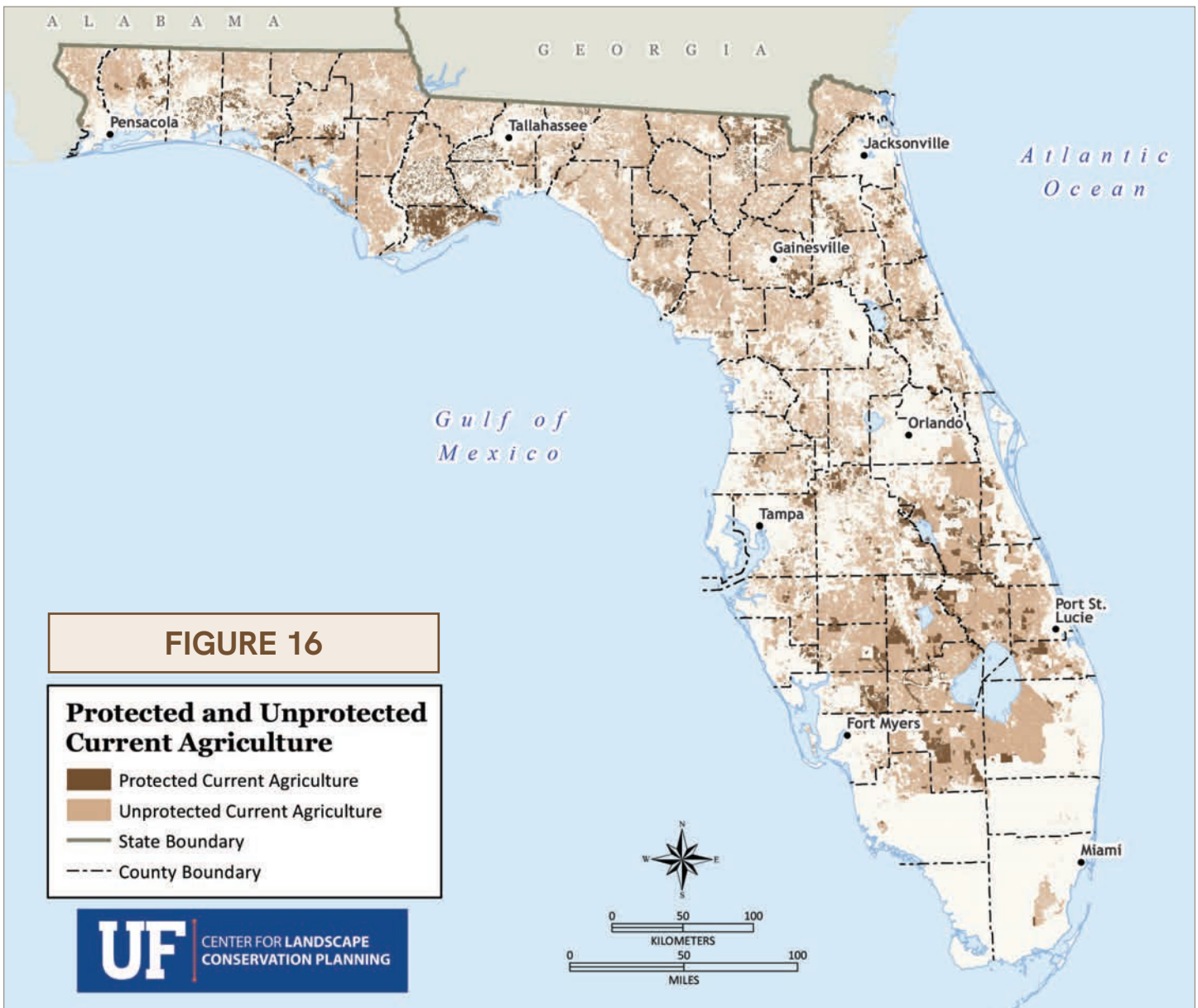
Date: 10/2023. Data: Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

continued

Opportunities for Protecting Florida's Agricultural Land

About 1.9 million acres – or 15.8% – of Florida's current agricultural land (including silvicultural, grazing, and other types of agriculture) have been protected through federal, state, local and private programs. These include conservation easement agreements with private property owners who enter legally binding commitments to limit or eliminate development on their property in return for payment for development rights, tax benefits, etc.

Protected and Unprotected Current Florida Agriculture



Date: 11/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

continued

While state land conservation programs traditionally prioritized the outright (fee simple) acquisition of lands that would result in the land becoming public, increased funding is now available for the purchase of easements, which means that most land will stay privately owned, will be managed by the landowner, and will stay on the tax rolls.

State land-protection programs – including Florida Forever and the Rural and Family Lands Protection Program – are the primary mechanisms by which Florida funds the purchase of full fee and conservation easements to protect priority natural lands throughout Florida. Traditionally, Florida Forever has focused more on conservation lands with emphasis on acquisition, although some agricultural lands have been protected through this program. Rural and Family Lands is geared specifically to protecting agricultural lands, with an emphasis on the purchase of easements to keep Florida’s working lands in private ownership and protected from development.

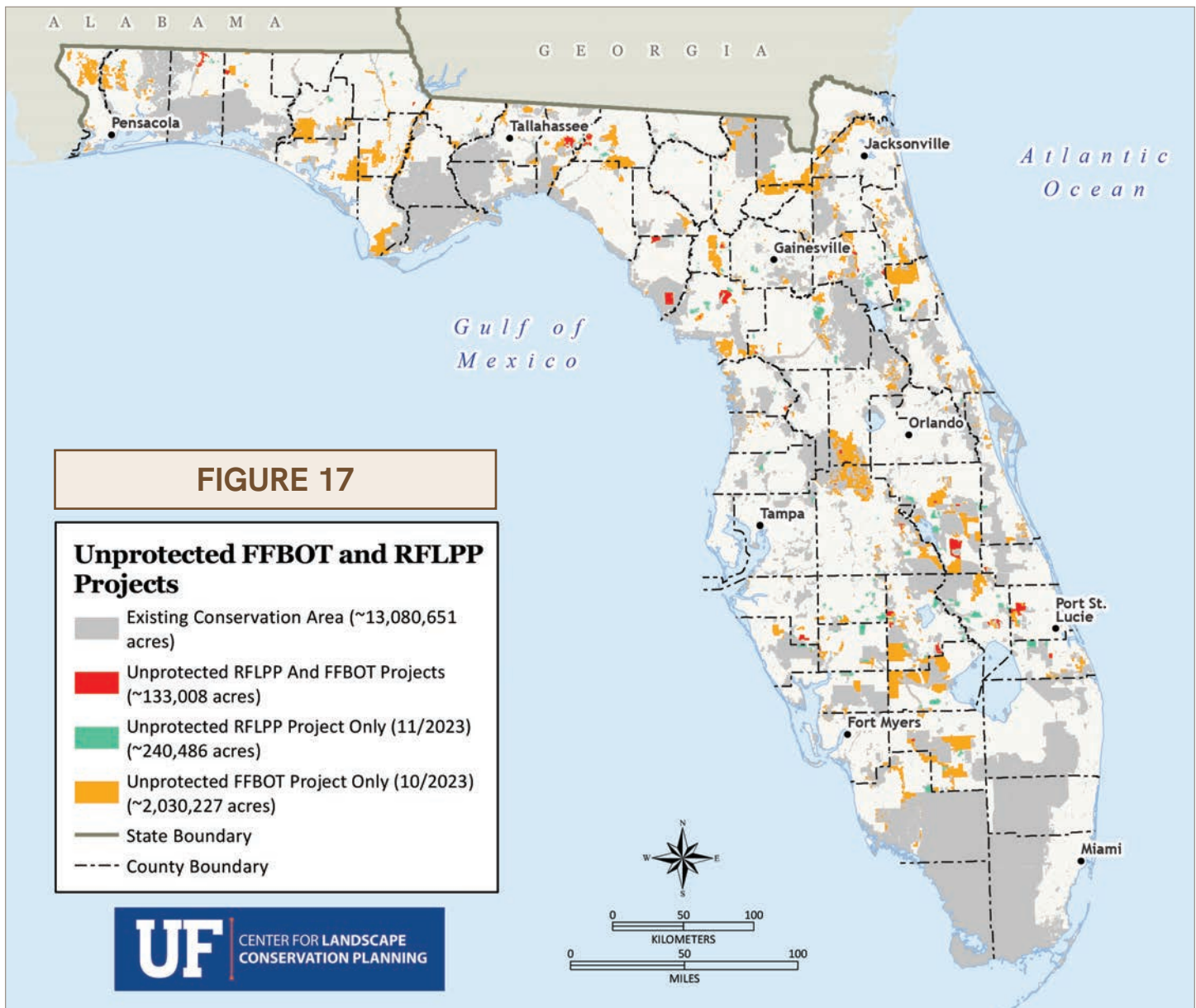
Efforts to protect Florida’s priority natural land also protect agricultural land. Nearly half (45%) of state land-protection projects – whether through Rural and Family Lands Protection Program (RFLPP) or Florida Forever – consist of agricultural land uses. Efforts to preserve biodiversity and ecosystem services in Florida often dovetail with efforts to protect agricultural lands.



Flatwoods/dry prairie on Blackbeard's Ranch by Thomas Hctor

continued

Unprotected Florida Forever and Rural and Family Lands Program Projects



Date: 1/2024. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

The Center also developed a series of suitability models to identify areas that are potentially good candidates for federal and state land-protection programs applicable to agricultural lands. To help identify the highest opportunity land for conservation, the Center created an Opportunities Model by compiling data from state and federal program suitability models.

It shows five levels of opportunity for protection across the state. Level 1, encompassing close to 1.3 million acres, includes land with the highest opportunity for protection.

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About 4.5 million acres are categorized as Level 2, having a moderate-high opportunity for protection, and more than 3.5 million acres are in Level 3, with a moderate opportunity. Levels 4 and 5, including land with low or no opportunity for protection, include close to 1 million acres.

Priority 2 lands, prominent in the Big Bend region and in the south-central and southwest peninsula, are suitable for one or more protection programs, but are not yet within a land conservation protection program. As such, they may represent the best locations for current agricultural conservation efforts given these areas are more likely to rank highly based on state or federal conservation priority criteria.

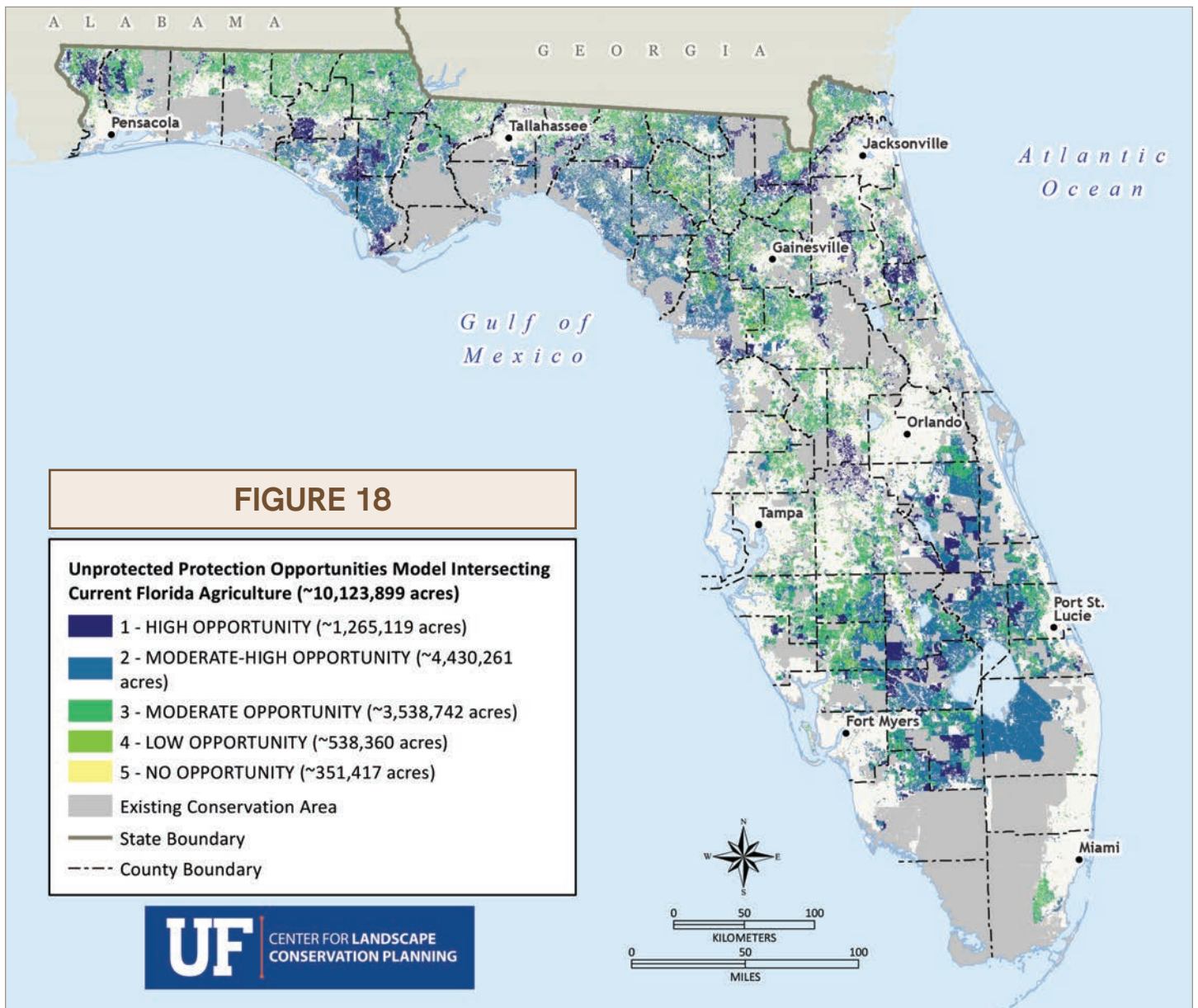
The U.S. Forest Service's Forest Legacy program was found to be most suitable for large tracts of unprotected forest throughout much of the state and especially the northern half. South-central Florida is often best suited for the Wetland Reserve Easement (WRE) program, especially around Lake Okeechobee. Other highly suitable unprotected areas include large portions of Gulf County, parts of Flagler County, and sections of Marion and Levy Counties. Unprotected areas in Leon, Osceola, Highlands, and Collier counties (among others) were found to be highly suitable for the Agricultural Land Easement (ALE) program.



Pine Forest Fog by Carlton Ward Jr / Wildpath

continued

Unprotected Protection Opportunities Model



Date: 12/2023. Data: Balmoral Group, Environmental Systems Research Institute, Florida Department of Agriculture and Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Geographic Data Library, Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, U.S. Census Bureau, U.S. Geological Survey. Projection: Albers Conical Equal Area

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Agricultural Policy and Planning Recommendations

Florida must work to further effective public policy, planning, and land management strategies to ensure that agriculture and its many values can flourish over the coming decades. These strategies should offer multiple options for both landowners and policy makers, include both voluntary and incentive-based strategies, and address both near and long-term planning horizons.

This is essential if Florida is to maintain and increase the level and range of ecosystem services (including enhancing resiliency, protecting water supply and quality, supporting flood control, sequestering carbon, protecting wildlife habitat and outdoor recreation opportunities, maintaining cultural resources, etc.) and the capability of agricultural land use to support our economy and food security.

To ensure that agriculture maintains its vital role, state and local public policy should support the following:

- **Robust funding.** At the state level, strategies to protect Florida's agricultural land include maintaining full funding for the Florida Forever and Rural and Family Lands Protection programs. Funding should be considered to be at least \$250 million per year for each of these two programs, meaning a primary state conservation land protection budget of no less than \$500 million per year. This level of funding will be necessary to effectively mitigate the pace of loss of rural and agricultural lands to development and to ensure strategic large rural landscape and wildlife corridors are protected. In addition, counties can establish local bond referenda to secure funding for the protection of conservation and agricultural land. Purchased easements on agricultural land are often the most beneficial as it allows land to stay privately owned, be managed by the landowner, and stay on the tax rolls. Myriad federal programs also provide funding – sometimes robust – to protect agricultural lands and their conservation values. These are administered by the Natural Resources Conservation Service (NRCS) and United States Fish and Wildlife Service (USFWS), among others. It is important to spread awareness of and take full advantage of these federal programs, and lobby for their continued and robust funding with an ample share earmarked for land conservation protection in Florida.
- **Sound community planning.** Local governments should continue to develop and implement county and municipal land and agricultural conservation plans that promote the protection of priority lands and minimize fragmentation. It is essential that communities develop and implement planning strategies so, when future development occurs, it is located in appropriate locations and has a more compact footprint designed at livable and marketable densities. Not only is this more fiscally

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responsible for local governments, but it can also lessen the pressure to convert natural lands to development. Sound development planning will also facilitate resiliency to continued climate and related changes. Finally, ongoing outreach to local elected officials and staff is needed so they understand the importance of agriculture and the role they can play to promote its long-term sustainability.

- **Science-based decision-making.** It is essential to continue public investment in the science necessary to foster sound land management and land use decision-making. This includes identifying and mapping critical lands and waters that are important to protect, monitoring and assessing the impacts of development on our natural systems and water supply and quantifying the value of ecosystem services provided by Florida's natural and agricultural lands while also developing effective strategies to protect those values.
- **Market-based solutions.** Maintaining viable working landscapes in Florida is critical for both the economy and the environment. In addition to agricultural output, as noted these lands provide myriad ecosystem services of public benefit. Developing science-based market mechanisms to incentivize the protection of ecosystem services at scale is an important component to ensure the long-term viability of agriculture and the services its land provides.

In Conclusion

Approximately 2.2 million acres of agricultural land – almost 19% – are projected to be lost by 2070 if Florida continues with its existing pattern of sprawling development. Even with more compact development patterns and some redevelopment, our state could still lose approximately 1.4 million agricultural acres.

Significant change is needed if agriculture is to continue as an economic powerhouse, provide long-term food security, and support essential conservation values and ecosystem services. Once agricultural land is converted to asphalt and rooftops, there is no turning back.

With a changing climate and shifting economy, flexibility will be key. However, it is clear that proactive land-use policy and planning options will be needed, along with close public and private landowner partnerships, to ensure the protection of Florida's agricultural landscapes into the future.

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APPENDIX A: Sea Level 2040/2070 Methodology

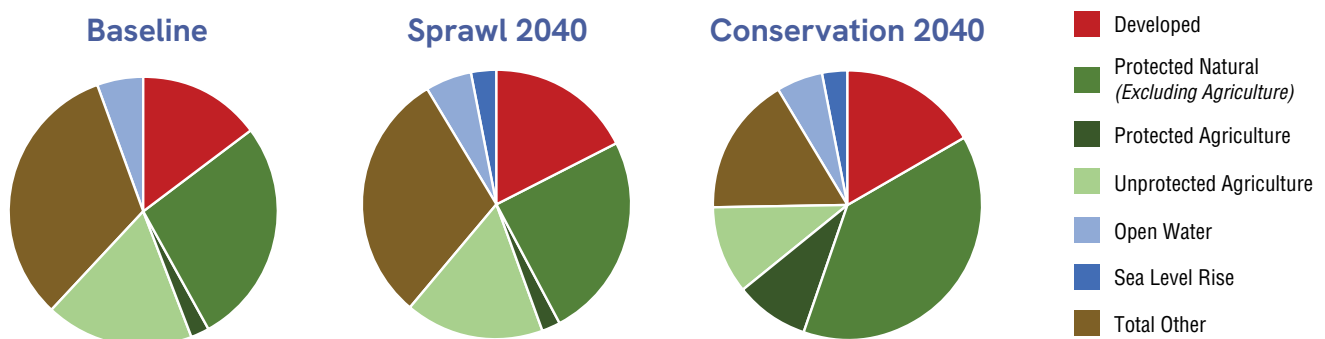
Sea Level 2040

Sea Level 2040 includes a baseline map depicting current conditions and two potential future scenarios dominated by additional sprawl or efforts to contain growth and protect important conservation lands:

- **Sprawl 2040** assumes 2019 densities and patterns of development will continue over the next two decades, factoring in the impacts of sea level rise on Florida’s lands.
- **Conservation 2040** accounts for the same population growth and sea level rise by 2040, but also emphasizes the opportunity to protect much of the state’s highest priority lands for conservation and agriculture and assumes new development will be 30% more compact.

Sea Level 2040 rests on four assumptions:

- **Florida’s population will grow by 23% or 4.9 million more residents to 26,406,000 residents in 2040** based on 2021 Florida Bureau of Economic and Business Research (BEBR) medium projections.
- **Sea Level will rise by 0.25 meters or almost 10 inches**, based on the 2022 NOAA intermediate projection.
- **Residents on lands to be lost to sea level rise will relocate**, with half allocated within the same county, and with overflow to adjacent counties if there is insufficient capacity. The other half are assumed to move out of state. Population impacts are based on a NOAA Intermediate sea level rise scenario and a Florida State University (FSU) study on population relocation (Hauer 2016).
- **Likelihood of future development of land will vary depending on its location and characteristics.** For example, lands in closer proximity to cities, major roads, or other features demonstrated to be more attractive to future development are deemed more likely to develop due to desirability.



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Sea Level 2070

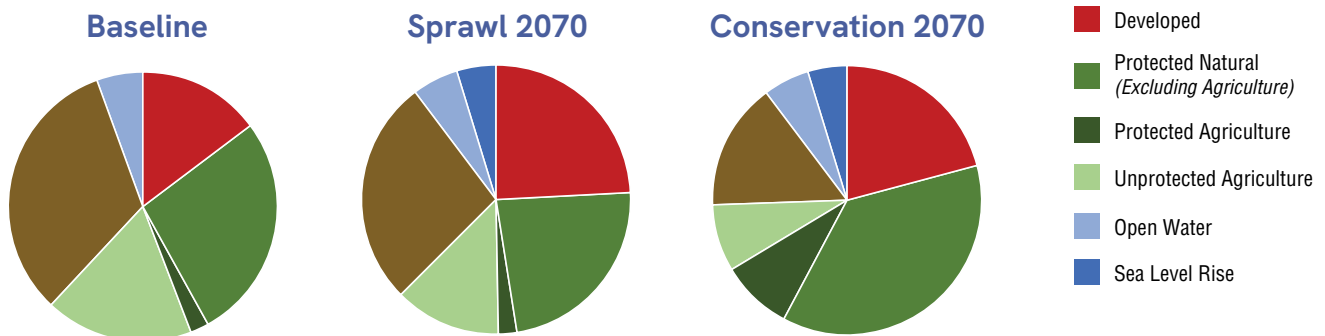
Sea Level 2070 presents two scenarios:

- **Sprawl 2070** assumes that 2010 densities and patterns of development will continue over the next five decades but factors in the impacts of sea level rise on Florida's lands and the resulting need for population relocation.
- **Conservation 2070** accounts for the same population growth and sea level rise by 2070, but also assumes that the state's identified priority natural conservation lands will be protected, any new development will be 20% more compact, and more redevelopment in urbanized areas will occur.

Sea Level 2070 is based on four assumptions:

- **Florida's population will grow by 57% – or 12.2 million more residents – to 33,721,828 residents in 2070**, based on 2015 Florida Bureau of Economic and Business Research (BEBR) medium projections.
- **Sea Level will rise by 0.9 meters or almost 3 feet**, based on a modified version of the 2017 NOAA intermediate high projection.
- **Residents on lands to be lost to sea level rise will relocate**, using the same assumptions and model as Sea Level 2040.
- **Likelihood of future development of land will vary depending on its location and characteristics**, again using the same model as Sea Level 2040.

More detailed information on Sea Level 2040 and Sea Level 2070 is available at the project website at 1000fof.org/sealevel2040.

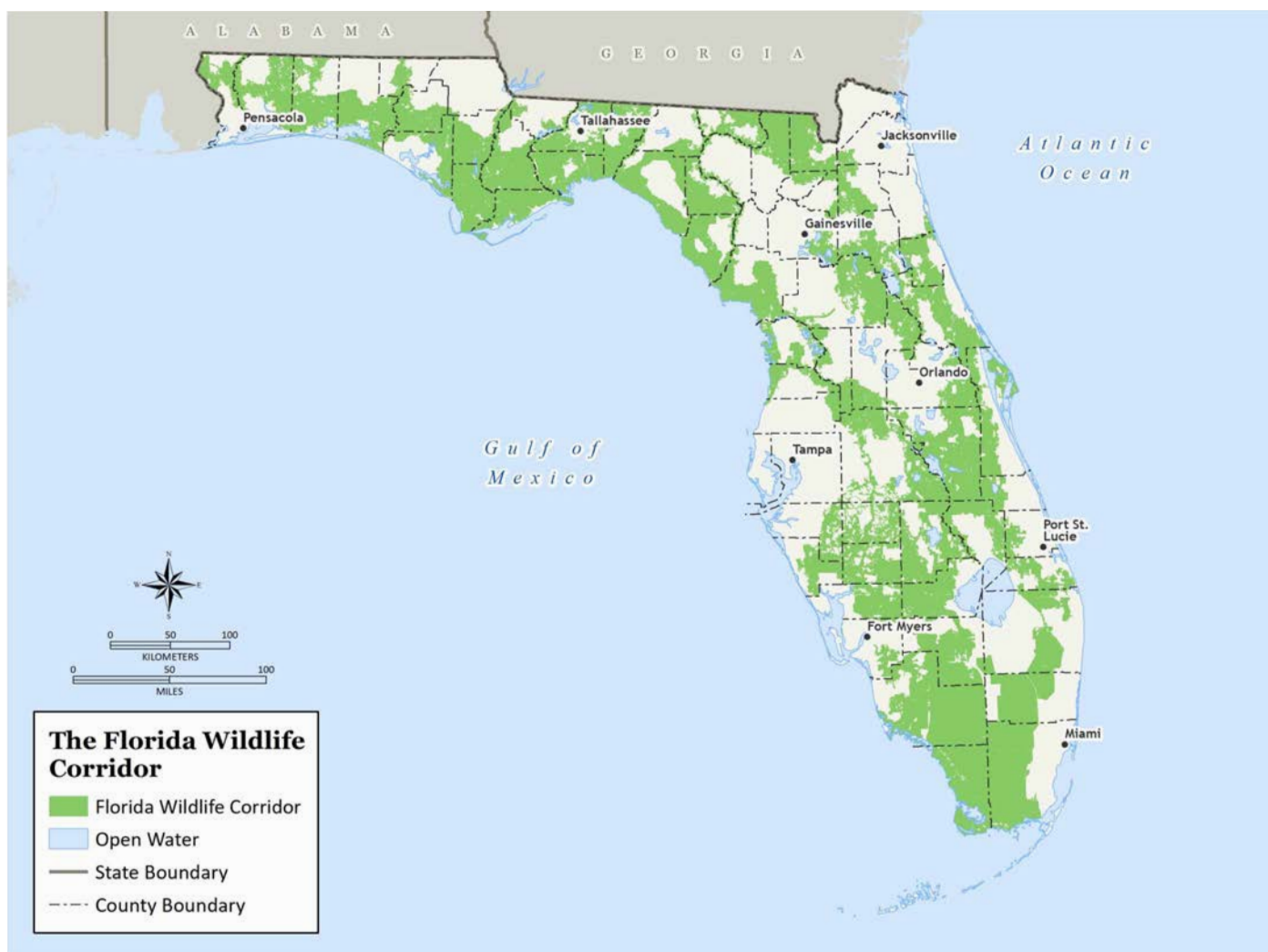


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APPENDIX B: Major Databases and Programs

Critical Lands and Waters Identification Project (CLIP) – Beginning in 2006, the Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, and Florida Fish & Wildlife Conservation Commission collaborated to produce CLIP, a statewide GIS database of priority lands with conservation values related to biodiversity, landscape function, surface water, groundwater, and marine resources.

Florida Ecological Greenways Network (FEGN) – While CLIP identifies sensitive natural lands anywhere in the state, the FEGN “identifies and prioritizes a functionally connected statewide ecological network of public and private conservation lands.” The University of Florida Center for Landscape Conservation Planning coordinated its initial development in 1995 and continues to maintain this GIS database, with the most recent statewide update in 2021. The FEGN is used as the foundation for many state initiatives, including the Florida Greenways Program, Florida Forever, Rural and Family Lands Protection



continued

Program and other state, federal, and regional land acquisition programs regarding the most important ecological corridors and intact landscapes across the state for protection of Florida’s native wildlife, ecosystem services, and ecological resiliency.

Florida Wildlife Corridor (Corridor) – The Corridor is a subset of the FEGN, encompassing its Priorities 1, 2, and 3 lands. It has been a state legislative priority in recent years, receiving significant funding through increased funding for the Florida Forever and Rural and Family Lands Protection Program. Avoidance of incompatible development on Corridor lands provides the foundation for the Sea Level 2040/2070 and Agriculture 2040/2070 Conservation Scenarios.

Florida Forever – One of the largest public land acquisition programs in the nation, Florida Forever – and its precursor Preservation 2000 (P2000) – have protected more than 2.6 million acres of land. Providing a blueprint for conserving Florida’s natural and cultural heritage, goals include water resource protection, coastal resiliency, cultural resource protection, public access to outdoor recreation, and the restoration and maintenance of public lands.

Rural and Family Lands Protection Program (RFLPP) – Created in 2001, this agricultural land preservation program is designed to protect important agricultural lands in Florida through the acquisition of permanent agricultural land conservation easements. Administered by the Florida Department of Agriculture and Consumer Services (FDACS), this initiative allocates funding appropriated by the Florida Legislature, primarily for the purchase of conservation easements on agricultural land.

Florida Natural Areas Inventory (FNAI) – This agency provides scientific support to the Florida Department of Environmental Protection (DEP) for Florida Forever, the state's environmental land acquisition program. FNAI contributes in two key ways: scientific review of newly proposed land acquisition projects, and comprehensive natural resource analysis and scoring of all Florida Forever projects.

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