Introduction

The Critical Lands and Waters Identification Project (CLIP) is a collection of spatial data that identify statewide priorities for a broad range of natural resources in Florida. CLIP grew out of a request in 2006, by the Century Commission for a Sustainable Florida, for a statewide inventory of natural resource priorities that could inform long range planning decisions.

CLIP has been developed through a collaborative effort between the Florida Natural Areas Inventory (FNAI), the University of Florida GeoPlan Center and Center for Landscape Conservation Planning, and the Florida Fish & Wildlife Conservation Commission (FWC). The CLIP partners have relied upon a team of expert advisors from state and federal agencies, water management districts, NGOs, and the private sector, to provide consensus guidance on data compilation and model construction.

CLIP 4.0 is organized into a set of core natural resource data layers which are combined into five resource categories: biodiversity, landscapes, surface water, groundwater, and marine. The first three categories have also been combined into the Aggregated CLIP model, which identifies five priority levels for natural resource conservation.

Groundwater and marine resources were not included in the combined model, as conservation strategies for those resources are typically different (primarily involving issues other than land use for example) from biodiversity, landscapes, and surface water resources.

NOTE: The Marine core data layers are not currently included in the CLIP 4.0 GIS data package, and are not discussed in this User Manual.
Important Guidelines for CLIP Data Use

Potential users of CLIP need to recognize that this statewide and regional scale database does not contain all data relevant to conservation in Florida. There are other data sets used by government agencies, non-government organizations, and private landowners that are useful or necessary to address specific aspects of conservation planning and management. However, CLIP can be used as a common framework or base to help inform and coordinate conservation planning at the statewide scale, and can support development of regional visions or conservation strategies. CLIP could also be useful for some aspects of local planning. Coordination of planning efforts is an essential means for providing both more effective and efficient protection of Florida’s green infrastructure, and CLIP provides an important opportunity to facilitate better coordination of conservation assessment, planning, and management across federal, state, regional, and local levels. Considering these points, the following disclaimers apply to the CLIP Database Version 4.0, and any maps created using CLIP data:

1. These data were created using input data consistent with 1:5,000 to 1:64,000 map scale resolution. Such data are of sufficient resolution for state and regional scale conservation planning. They are not appropriate for use in high accuracy mapping applications such as property parcel boundaries, local government comprehensive plans, zoning, DRI, site plans, environmental resource or other agency permitting, wetland delineations, or other uses requiring more specific and ground survey quality data.

2. The CLIP analysis, maps and data were developed for state and regional conservation planning purposes and are not intended, nor sufficient, to be the basis for local government comprehensive plans, environmental resource or agency permitting decisions.

3. These data are likely to be regularly updated and it is the responsibility of the user to obtain the most recent available version of the database.

4. Data should not be transferred to a third party, in data or map form, without noting these disclaimers. In addition, we encourage all users to direct other interested parties to the CLIP website to download data versus sharing data directly.

Users also need to be aware that CLIP data is currently developed using multiple statewide land use / land cover data that were developed through the years 2003-2015. Therefore, users can expect that some new development may not be reflected in the CLIP Database. Furthermore, because of the scale issues discussed in disclaimer #1 above, developed land uses could also occur in areas identified as CLIP priorities due to associated spatial error with 1:5,000 to 1:64,000 scale data. The user must recognize this when reviewing and using CLIP data especially for any local to regional applications.

Private lands identified on CLIP maps may be good candidates for voluntary land acquisition programs, other public and private conservation programs, mitigation or conservation banks, or for use of innovative land planning such as conservation design, rural clustering, conservation easements, transfer of development rights, or Rural Lands Stewardship Areas, all of which seek to conserve significant natural resources. CLIP priorities represent important ecological stewardship opportunities for Florida but are not intended as an additional encumbrance on landowners other than such protections as may already be afforded by federal, state or local laws.
Strategic Habitat Conservation Areas

Source: Florida Fish & Wildlife Conservation Commission

CLIP 4.0 Version: species re-prioritized in 2016; based on 2009 FWC habitat models and analysis.

What it means for my site
Suitable habitat for one or more rare or vulnerable vertebrate species. Those species likely require this area in order to maintain viable populations in Florida for the foreseeable future. Highest priorities indicate the rarest or most vulnerable species, but all priority levels have conservation value.

This data layer was created by FWC to identify gaps in the existing statewide system of wildlife conservation areas, and to inform ongoing land acquisition and conservation efforts. FWC modeled areas of habitat that are essential to sustain viable populations for 34 species of terrestrial (land-based) vertebrates that are not adequately protected on existing conservation lands. The CLIP version also identifies habitat on conservation lands for all 62 species analyzed for the project.

Limitations
Depicts potential suitable habitat for each species based on land cover types, but the species may not occupy all of this habitat. Focused on rarest terrestrial vertebrate species (mammals, birds, reptiles, amphibians); not intended to address conservation needs for aquatic species, plants, or invertebrates.

For more information

Related data: Potential Habitat Richness (another CLIP core data layer); Integrated Wildlife Habitat Ranking System; Landsat Vegetation and Land Cover, 2003
Potential Habitat Richness

Source: Florida Fish & Wildlife Conservation Commission

CLIP 4.0 Version: updated 2009, based on 2003 FWC landsat vegetation and land cover (no change from CLIP 3.0)

What it means for my site

Suitable habitat for one or more rare or vulnerable vertebrate species. Richness refers to the number of species overlapping at any location. The most overlapping species in this model is 13.

This data layer was created by FWC to identify additional habitat areas important for conservation, beyond those areas identified in the Strategic Habitat Conservation Areas analysis. FWC modeled potential habitat for 62 species of terrestrial (land-based) vertebrates that may not be adequately protected on existing conservation lands. Thirty-four of those species were determined to require SHCAs in order to maintain viable populations, while the remaining 28 species did not require additional SHCAs outside of conservation lands. All 62 species are included in this richness layer.

Limitations

Does not consider conservation need of each species, simply counts overlapping species. Depicts potential suitable habitat for each species based on land cover types, but the species may not occupy all of this habitat. Focused on rarest terrestrial vertebrate species (mammals, birds, reptiles, amphibians); not intended to address conservation needs or species richness for aquatic species, plants, or invertebrates.

For more information


Related data: Strategic Habitat Conservation Areas (another CLIP core data layer); Integrated Wildlife Habitat Ranking System; Landsat Vegetation and Land Cover, 2003
Rare Species
Habitat Conservation Priorities

Source: Florida Natural Areas Inventory

CLIP 4.0 Version: major revision in 2013, based on 2009-2012 Cooperative land cover (no change from CLIP 3.0)

What it means for my site
Suitable habitat for one or more rare or vulnerable species that are known to occur in the vicinity. Highest priorities could indicate a single species with very high conservation need, or multiple species with high conservation need. All priorities reflect rare species with conservation need.

This data layer was created by FNAI originally to inform the Florida Forever environmental land acquisition program, and was prioritized based partly on the amount of species’ habitat currently protected on conservation lands. The CLIP version has been re-prioritized to reflect more general conservation needs for rare species. FNAI modeled suitable habitat around documented locations for 281 species of plants, invertebrates, and vertebrates, including aquatic species.

Limitations
Identifies habitat only around known locations. This is most likely comprehensive for some well-studied species with restricted ranges, but many species are likely to occur beyond the identified habitat. Focused on rarest species; not intended to address conservation needs or species richness for more common species.

For more information
**Priority Natural Communities**

**Source:** Florida Natural Areas Inventory

**CLIP 4.0 Version:** updated 2016, based on 2010-2015 Cooperative Land Cover version 3.1

**What it means for my site**

The location appears to feature one of 12 priority natural community types: upland glades, pine rocklands, seepage slopes, scrub, sandhill, sandhill upland lakes, rockland hammock, coastal uplands, imperiled coastal lakes, dry prairie, upland pine, pine flatwoods, upland hardwood forest, or coastal wetlands. These natural communities are prioritized by a combination of their heritage global status rank (G-rank) and landscape context, based on the Land Use Intensity Index (subset of CLIP Landscape Integrity Index) and FNAI Potential Natural Areas. Priority 1 includes G1-G3 communities with Very High or High landscape context. Priority 2 includes G1-G3 Medium and G4 Very High/High. Priority 3 includes G4 Medium and G5 Very High/High. Priority 5 is G5 Medium.

This data layer was created by FNAI originally to inform the Florida Forever environmental land acquisition program. The natural communities were mapped primarily based on the FNAI/FWC Cooperative Land Cover (CLC) data layer, which is a compilation of best-available land cover data for the entire state. The CLC is based on both remote-sensed (from aerial photography, primarily from water management district FLUCCS data) and ground-truthed (from field surveys on many conservation lands) data.

**Limitations**

Not intended to be a comprehensive map of all natural communities in Florida. Landscape context value is determined by remote-sensed data only.

**For more information**

Related data: Cooperative Land Cover
Florida Ecological Greenways Network

Source: University of Florida Geoplan Center and Center for Landscape Conservation Planning

CLIP 4.0 Version: priorities revised in 2016, based on major revision in 2013

What it means for my site

Either part of a large landscape-scale “hub”, or an ecological corridor connecting two or more hubs. Hubs indicate core landscapes that are large enough to maintain populations of wide-ranging or fragmentation-sensitive species including black bear or panther and areas that are more likely to support functional ecosystem services. Highest priorities indicate the most significant hubs and corridors in relation to completing a functionally connected statewide ecological network, but all priority levels have conservation value.

This data layer was created by the University of Florida Center for Landscape Conservation Planning to provide an ecological component to the Statewide Greenways System plan developed by the Dept. of Environmental Protection, Office of Greenways and Trails. It is intended to represent a statewide network of ecological hubs and linkages designed to maintain landscape-scale ecological functions and fragmentation sensitive biodiversity throughout the state.

Limitations

Mapped corridors represent opportunity areas within which a linkage could be maintained; not all of the area identified in a corridor is necessarily required in order to protect a functional linkage. There are specific wildlife corridor design criteria that should be consulted during the process of designing functional corridors to facilitate protection of habitat, wildlife movement, and ecosystem services. Not all local and regional (multi-county) potential corridors are identified, as this model has a statewide to regional focus. Local identification of potentially important ecological/wildlife corridors should also include identification of local and regional riparian (stream) networks, contiguous swaths of natural and semi-natural land between existing conservation lands, or other known wildlife corridors that may not all be included within the FEGN.

For more information

FEGN reports: http://conservation.dcp.ufl.edu/FEGN.html

Related data: CLIP Landscape Integrity
Landscape Integrity Index

Source: University of Florida Geoplan Center and Center for Landscape Conservation Planning

CLIP 4.0 Version: updated 2015; based on 2010-2015 Cooperative Land Cover version 3.1

What it means for my site
Higher values indicate large expanses of remote, intact natural and semi-natural areas such as the Everglades or the Apalachicola and Ocala National Forests. Lower values indicate more fragmented landscapes with increasingly intensive land uses from agriculture to urban development. Generally, values of 1-3 are considered to have little to no ecological integrity; values of 4-7 are considered to have moderate ecological integrity; and values of 8-10 are considered to have high ecological integrity.

This data layer was created by the University of Florida Center for Landscape Conservation Planning specifically for CLIP. It combines two models: natural land cover patch size and land use intensity. Both are based on the FNAI/FWC Cooperative Land Cover (CLC) data layer, and major roads data from the Florida Department of Transportation (which are used to help delineate patches). Unlike most of the CLIP core data layers, the Landscape Integrity Index is a continuous scale, from intensive urban areas to remote natural areas, that covers the entire state.

Limitations
Not intended to address specific resource issues such as species habitat, natural communities, or water resources. More specifically, this index of ecological integrity is intended primarily to address terrestrial areas; based on the way the patch size and land use intensity indices were created, most larger water bodies receive a moderate index score, which is likely not an accurate indicator of the integrity of those aquatic ecosystems. Some areas of low to moderate landscape integrity could still be high priority for other natural resources; in contrast, some areas with high landscape integrity scores might have lower ecological integrity due to site specific threats such as fire suppression of fire-dependent natural communities or infestations of exotic/invasive species.

For more information
Technical report: CLIP 4.0 Final Report
Related data: Cooperative Land Cover, CLIP Landscape Integrity
**Significant Surface Waters**

**Source:** [Florida Natural Areas Inventory](https://fnai.org/

**CLIP 4.0 Version:** major revisions in 2016

**What it means for my site**

The location contributes water runoff to a surface water feature that has statewide significance, including: aquatic preserves, shellfish harvesting areas, seagrass beds, springs, public water supply sources, watersheds important for rare fish species, Outstanding Florida Waters, National Wild & Scenic Rivers, and National Estuaries. Highest priorities are immediately adjacent to significant surface waters, while lower priorities include all watersheds that contribute to significant surface waters.

This data layer was created by FNAI, in consultation with water resource experts, originally to inform the Florida Forever environmental land acquisition program. It identifies buffers to important surface water bodies as well as watersheds that contribute to those water bodies. It is prioritized based on how close the location is to the water body and how much of the water body is affected downstream of the location.

**Limitations**

Focused on surface waters presumed to be in relatively natural condition with good water quality. Not intended to address surface waters with substantial restoration needs. Does not address groundwater contributions to surface waters (or surface water contribution to groundwater).

**For more information**


Related data: CLIP Aquifer Recharge
Natural Floodplain

**Source:** Florida Natural Areas Inventory

**CLIP 4.0 Version:** priorities revised in 2016 based on CLIP 4.0 Landscape Integrity; major revision in 2013 based on FEMA data

**What it means for my site**

The location appears to be within the FEMA 100-year floodplain, and is in relatively natural condition. Highest priorities indicate highest quality natural areas within FEMA 100-year floodplain.

This data layer was created by FNAI, in consultation with water resource experts, originally to inform the Florida Forever environmental land acquisition program. It identifies FEMA 100-year floodplain for most counties, or a surrogate model for 100-year floodplain (based on wetlands and soils) where FEMA data isn’t complete. It is prioritized based on land use intensity (sub-model of CLIP Landscape Integrity Index) and FNAI Potential Natural Areas.

**Limitations**

Not all counties have FEMA data, so there are some noticeable edge effects along a few county lines where the surrogate data were used, particularly in south Florida.

**For more information**


Related data: Wetlands (another CLIP core data layer; scroll down to Documentation section)
**Wetlands**

*Source:* Florida Natural Areas Inventory

*CLIP 4.0 Version:* updated 2016, based on 2010-2015 Cooperative Land Cover version 3.1

**What it means for my site**

The location appears to be a wetland land cover type. Highest priorities indicate wetlands within large intact natural landscapes (although the wetlands themselves may be small or large). Lowest priorities indicate wetlands within fragmented landscapes surrounded by intensive agriculture or urban development; these may still have conservation value.

This data layer was created by FNAI, in consultation with water resource experts, originally to inform the Florida Forever environmental land acquisition program. Wetlands were mapped based on the FNAI/FWC Cooperative Land Cover (CLC) data layer, which is a compilation of best-available land cover data for the entire state. The CLC is based on both remote-sensed (from aerial photography, primarily from water management district FLUCCS data) and ground-truthed (from field surveys on many conservation lands) data. Wetlands are prioritized by overlap with FNAI Potential Natural Areas and the UF Land Use Intensity Index (a component of the Landscape Integrity Index).

**Limitations**

This wetlands layer is based primarily on remote-sensed data, and is not accurate enough for regulatory wetlands delineation. Minimum mapping unit was 0.5 acres, so smaller wetlands are not included. Some pine plantations that could be classified as wetlands are not included.

For more information

*Technical report:* Conservation Needs Assessment Technical Report (scroll down to Documentation section for link)

*Related data:* Natural Floodplain (another CLIP core data layer; scroll down to Documentation section); Cooperative Land Cover
Aquifer Recharge

Source: Florida Natural Areas Inventory and Advanced GeoSpatial, Inc.

CLIP 4.0 Version: minor revision in 2015

What it means for my site

High priorities indicate high potential for recharge to an underlying aquifer system (typically the Floridan aquifer, but could be intermediate or surficial aquifers in some portions of the state). The highest priorities indicate high potential for recharge to springs or public water supplies.

This data layer was created by FNAI in collaboration with Advanced GeoSpatial, Inc., originally to inform the Florida Forever environmental land acquisition program. AGI developed an initial Recharge Potential model following a similar model to the Florida Aquifer Vulnerability Assessment (FAVA). Data inputs included soil hydraulic conductivity, proximity to karst features, depth to water, and overburden. FNAI removed discharge areas and prioritized the model based on overlap with Springs Protection Areas and buffers to public water supply wells.

Limitations

This data layer is statewide in resolution; each of Florida’s five water management districts may have more detailed aquifer recharge data that covers their district boundaries.

For more information


Related data: Florida Aquifer Vulnerability Assessment; Springs Protection Areas
This model is a combination of the four core data layers in the Biodiversity Resource Category: Strategic Habitat Conservation Areas (SHCA), Vertebrate Potential Habitat Richness (VertRich), Rare Species Habitat Conservation Priorities (FNAIHAB), and Priority Natural Communities (Natcom). They are combined in this model according to these criteria:

**Priority 1:** SHCA Priority 1, VertRich 8-13 overlapping species, FNAIHAB Priority 1-2, Natcom Priority 1.

**Priority 2:** SHCA Priority 2, VertRich 7 species, FNAIHAB Priority 3, Natcom Priority 2.

**Priority 3:** SHCA Priority 3-4, VertRich 5-6 species, FNAIHAB Priority 4, Natcom Priority 3.

**Priority 4:** SHCA Priority 5, VertRich 2-4 species, FNAIHAB Priority 5-6, Natcom Priority 4.

**Priority 5:** VertRich 1 species.

A location needs to match criteria for only one core data layer to meet that priority class criteria (the criteria don’t require overlap of core data layers).

Wherever a location meets criteria for more than one priority class, the highest priority is assigned.
This model is a combination of the two core data layers in the Landscapes Resource Category: Florida Ecological Greenways Network, and Landscape Integrity Index. They are combined in this model according to these criteria:

**Priority 1:** Greenways Critical Linkages (P1).

**Priority 2:** Landscape Integrity value 10.

**Priority 3:** Greenways Priorities 2-3, Landscape Integrity value 9.

**Priority 4:** Greenways Priorities 4-5, Landscape Integrity values 7-8.

**Priority 5:** Landscape Integrity value 6.

A location needs to match criteria for only one core data layer to meet that priority class criteria (the criteria don’t require overlap of core data layers).

Wherever a location meets criteria for more than one priority class, the highest priority is assigned.
Surface Water Resource Priorities

This model is a combination of the three core data layers in the Surface Water Resource Category: Significant Surface Waters, Natural Floodplain, and Wetlands. They are combined in this model according to these criteria:

**Priority 1:** Surface Water Priority 1, Floodplain Priority 1, Wetlands Priority 1.

**Priority 2:** Surface Water Priority 2, Floodplain Priority 2, Wetlands Priority 2.

**Priority 3:** Surface Water Priority 3, Floodplain Priority 3, Wetlands Priority 3.

**Priority 4:** Surface Water Priorities 4-5, Floodplain Priority 4, Wetlands Priority 4.

**Priority 5:** Surface Water Priorities 6-7, Floodplain Wetlands Priorities 5-6.

A location needs to match criteria for only one core data layer to meet that priority class criteria (the criteria don’t require overlap of core data layers).

Wherever a location meets criteria for more than one priority class, the highest priority is assigned.
Aggregated CLIP Priorities

CLIP 4.0 Aggregated Resource Priorities

The aggregated CLIP 4.0 Resource Priorities include five priority levels depicting conservation significance for protecting biodiversity, landscape attributes, and high quality surface water resources at the statewide scale. It is a combination of the Biodiversity, Landscapes, and Surface Water Resource Priorities models based on the following criteria:

**Priority 1:** Priority 1 for any of the three Resource Categories, or Priority 2 for ALL three Resource Categories.

**Priority 2:** Priority 2 for any of the three Resource Categories, or Priority 3 for ALL three Resource Categories.

**Priority 3:** Priority 3 for any of the three Resource Categories.

**Priority 4:** Priority 4 for any of the three Resource Categories.

**Priority 5:** Priority 5 for any of the three Resource Categories.

Unlike the Resource Priorities models, the Aggregated CLIP model does take into account overlap across resource types to promote some areas to Priorities 1 and 2.

Wherever a location meets criteria for more than one priority class, the highest priority is assigned.

Although all priority levels have significance, based on expert consensus the most important priorities are CLIP Priorities 1 and 2. CLIP Priority 3 can be considered moderate priority at the statewide scale. CLIP Priority 4 includes areas that still have resource significance but are the lower ranked areas for many of the CLIP core data layers. CLIP Priority 5 primarily includes broader watersheds with relevance from a cumulative impact perspective for protecting important watersheds identified in the Significant Surface Waters core data layer.
How is CLIP 4.0 Different from CLIP 3.0?

Since CLIP 3.0, there have been revisions to several of the core data layers, leading to changes in the resource priorities and overall CLIP priorities models. The Resource Category priority criteria have also been changed slightly from CLIP 3.0, in response to core data changes.

The result is a slight increase in CLIP Priority 1 from 13.7 million acres to 14.5 million acres (land only – some CLIP priorities cover water bodies also). For reference, the total land area of Florida is about 34 million acres.

Often, CLIP Priorities 1-2 are considered together as high resource priorities. When considering both priorities, there is a slight reduction from 20.0 million to 19.6 million acres. While there is a slight net reduction, the map at right shows there are both additions and subtractions around the state.

Areas in light green are identified as CLIP P1-2 in both CLIP 3.0 and CLIP 4.0. Areas in red were CLIP P1-2 in CLIP 3.0 but are no longer identified as high priority (these areas are now likely to be found in lower CLIP priority classes). Areas in dark green were not high priority in CLIP 3.0, but are now Priorities 1-2.

What accounts for these changes?

Areas no longer in CLIP P1-2 (red) are primarily due to major revisions to the Significant Surface Waters layer, especially in south Florida. New additions to CLIP P1-2 (dark green) are primarily due to revisions to greenway corridors.
The CLIP Query Tool is a data layer designed to easily query the full CLIP database for any location. This data layer is a raster grid named “clip4_query” and is included with the CLIP v4.0 database package.

The user needs to have the clip4_query grid loaded in an ArcGIS environment, and set as the focus of the Identify tool, as shown in the example at right.

In this example, the aggregated CLIP model (“clip_prio_v4” grid) is displayed. The user has clicked the Identify tool on the small medium-dark-green patch indicated by the blue pointer. The Identify window shows attribute data from the clip4_query grid for the chosen pixel.

In this case we see that the selected area is CLIP Priority 2, and that this is due to the Biodiversity Resource Priorities alone (Landscape RP is P4, Surface Water RP is P5). We can further determine that the area is designated Biodiversity Priority 2 due to the Strategic Habitat Conservation Areas (SHCA) Core Data Layer, which is Priority 2 in this location.

Note that the Value field for the clip4_query grid is ignored here (it simply assigns a unique value to each unique combination of CLIP data layers – more than 550,000 combinations in all).

This CLIP query grid allows users to quickly see all CLIP natural resource values for a location, and understand which core data layers are responsible for the aggregated CLIP priority value at a glance.
Final Thoughts on CLIP

- **CLIP is more than a map.** It is a GIS database consisting of 20 core data layers and 4 overlay models. The Aggregated CLIP Priorities map should not necessarily be used in isolation from its components. Users may find that different subsets of CLIP data are useful for different purposes.

- **CLIP is a natural resource inventory.** It is not a conservation plan. The database and report make no recommendations for specific actions for priority areas. Users should not assume that intensive land uses are incompatible with all high priority areas, or that such land uses are always compatible with low priority areas.

- **CLIP is a decision support tool.** CLIP’s primary value is as a screening tool to quickly identify areas with high natural resource value. Users should then follow up with more thorough study of these areas using a variety of data and sources to confirm the significance of resources. CLIP can help identify tradeoffs in choosing land use actions on one area compared to another.