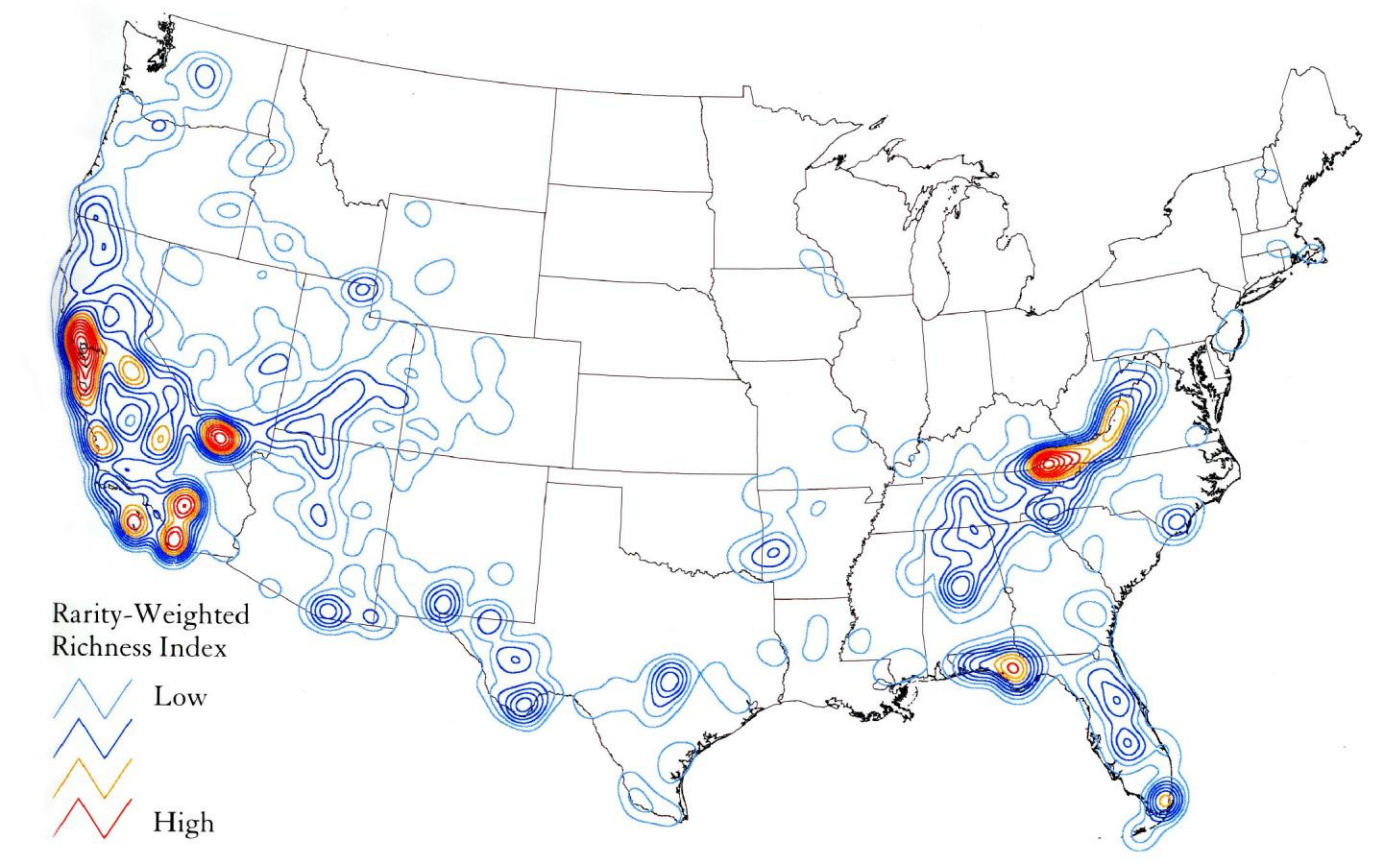
Species Protection & Enhancement

Vernon Compton

August 19, 2013

THE LONGLEAF ALLIANCE

Biological Hotspot



Biodiversity Hotspot:

from The Florida Panhandle by Richard J. Blaustein

- Ecologist Bruce Means, founder and executive director of the Coastal Plains Institute and Land Conservancy in Tallahassee and adjunct professor at Florida State University, has been involved in conservation in the panhandle for more than 40 years. He points out that no area of its size in the United States or Canada has more species of frogs (27) or snakes (42), and it ranks about third in the world for turtle species (18). The diversity of salamanders (28 species), and birds (approximately 300 species), is also very high. “All this is a reflection of the high habitat diversity of the Florida Panhandle,” Means says. The panhandle is also home to over 200 species of fish species.

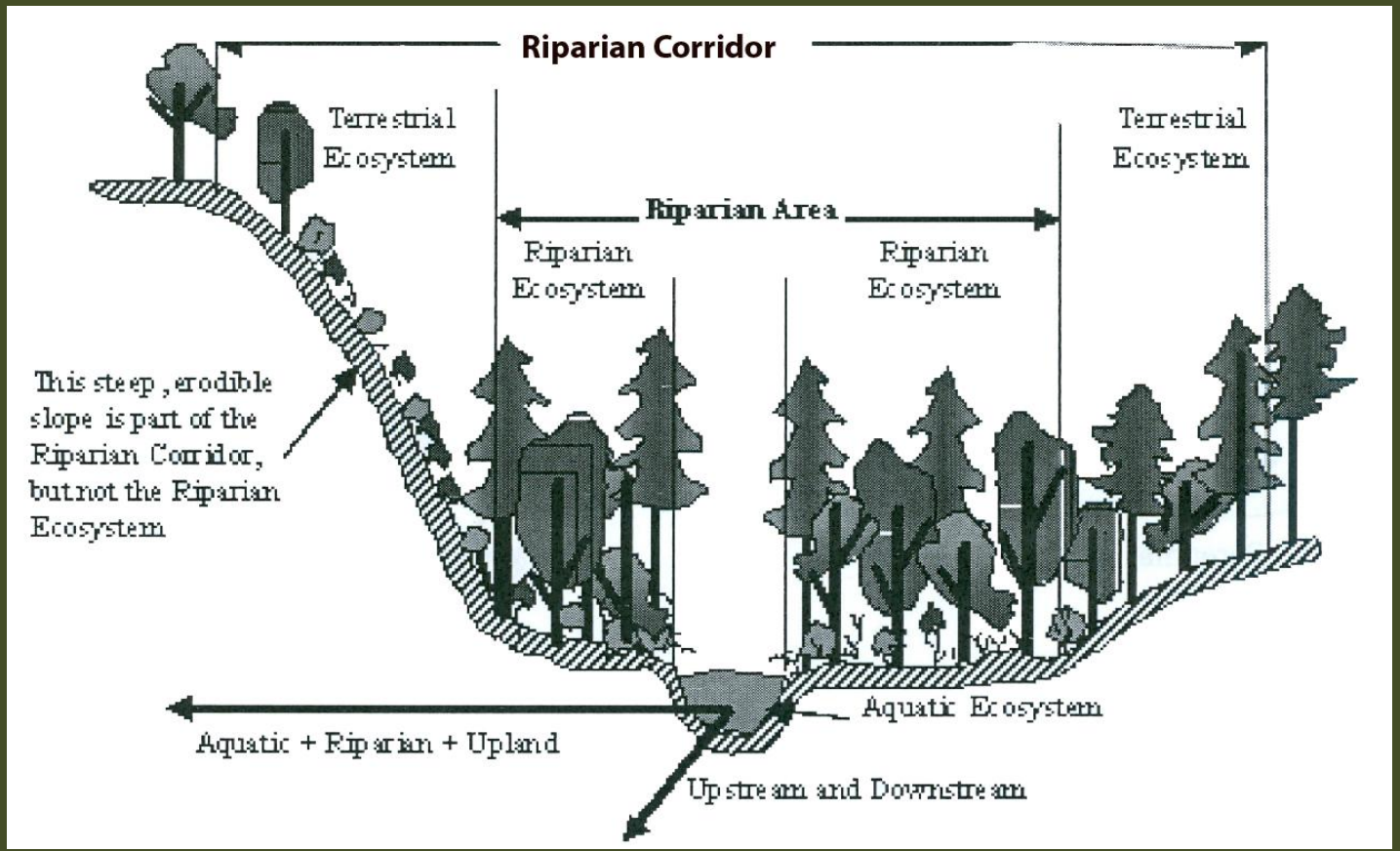
Plant Diversity

- "remarkable floristic diversity"
- At a within-community scale, longleaf vegetation can be among the most diverse in North America with some examples having 40 or more species of higher plants per square meter (Walker and Peet 1983) or 170 per 1000 m^2 (Peet, Carr and Gramling 2006; W. J. Platt personal communication).....This diversity is particularly conspicuous in the floristic richness and endemism of the region. There are on the order of 6000 vascular plant taxa that occur on the southeastern Coastal Plain, which represents almost a quarter of all plant species that occur in North America north of Mexico. Moreover, 1630 taxa are endemic to the Coastal Plain, and with 1306 full species included (Sorrie and Weakly 2001, 2006). The region falls just short of qualifying as one of the top 25 biodiversity hotspots on the globe (see Myers et al. 2000). A large proportion of the endemics occur in the longleaf-dominated vegetation (Sorrie and Weakley 2005).

- From Robert K. Peet, *Ecological Classification of Longleaf Pine Woodlands*

Ecosystem

- An environment in which living things and their surroundings interact in a matter that sustains them both.
- Aquatic ecosystem – those natural systems that are either permanently or periodically under water. Includes both marine and freshwater systems and wetlands.
- Terrestrial ecosystem – a system of plants, animals, nutrients and elements, and the interactions between them, that is found on the land.


Riparian Corridor
Terrestrial Ecosystem
Terrestrial Ecosystem
Riparian Area
Riparian Ecosystem
Riparian Ecosystem
This steep, erodible slope is part of the Riparian Corridor, but not the Riparian Ecosystem
Aquatic Ecosystem
Aquatic + Riparian + Upland
Upstream and Downstream

Watershed Approach

from Integrated Water Management by Marilyn Crichlow

- A watershed can be described as the area of land that delivers runoff water, sediment and dissolved substances to a river. It serves as an integration of ecosystems of flora and fauna, land and water and their mutually interacting elements.
- A sound watershed management plan will provide the frame for harmonizing economic development and environmental protection. It will also integrate socio-economic and cultural realities, institutional structures and the biological aspects into upland protection and conservation in order to attain sustainable development.

Pensacola Bay Watershed

Perdido River Watershed

Wikipedia

Improving Watershed Health through Restoration

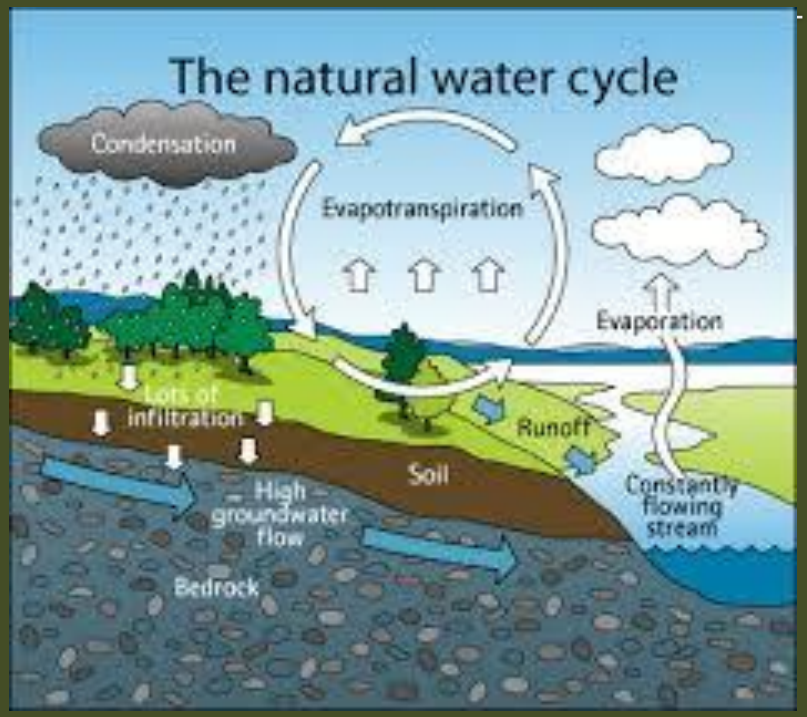
- An area cannot maintain or achieve a healthy watershed without also having healthy uplands.
- To restore watersheds, threats to those systems much first be identified so they can be addressed appropriately. This includes addressing aquatic and terrestrial needs.
- Pollution – the presence in the outdoor atmosphere or water of any substances, contaminants, or human-induced impairment or alterations of air and water in quantities or at levels which are or may be harmful to animal or plant life or human health and welfare.

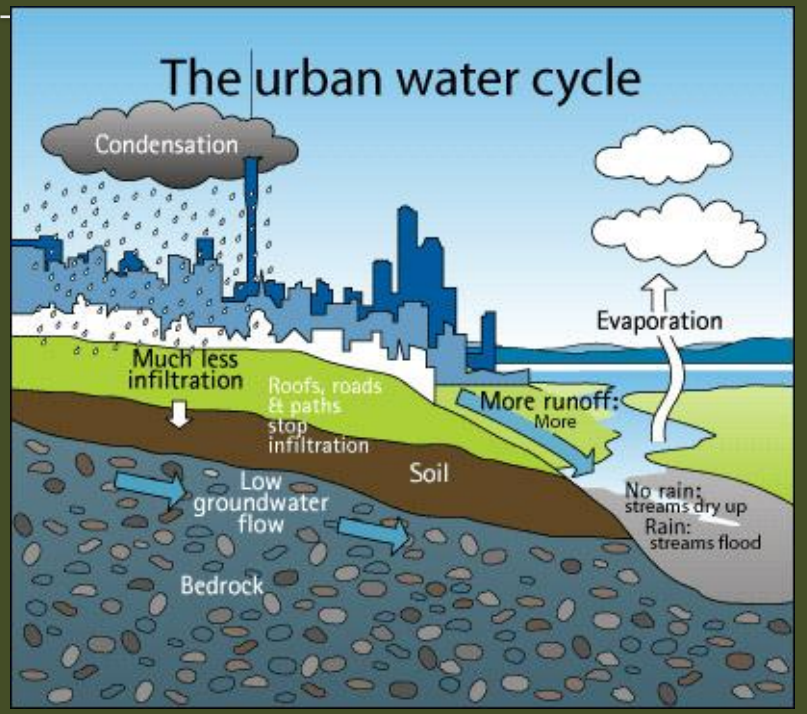
Aquatic Ecosystems - Wetlands

- The hydrological regime, which is determined by the duration, flow, amount, and frequency of water on a site, is typically the primary factor driving the other ecological elements of the system.
- Human development and management actions can have negative impacts on elements of the hydrologic regime

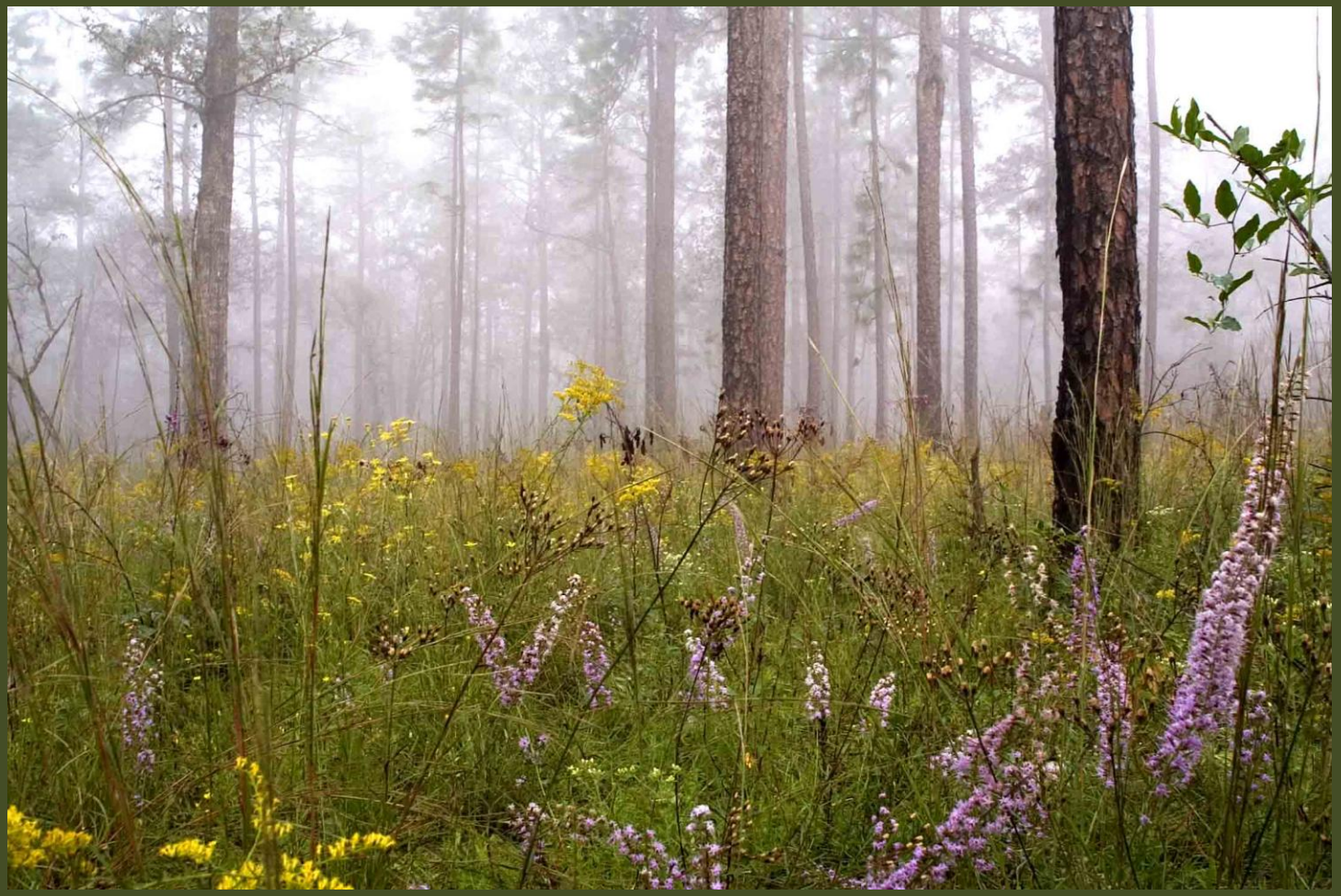
Aquatic Ecosystems – Marine and Freshwater

Water Cycle


The natural water cycle
Condensation
Evapotranspiration
Evaporation
Lots of infiltration
Runoff
Soil
High groundwater flow
Constantly flowing stream
Bedrock


The urban water cycle
Condensation
Evaporation
Much less infiltration
Roofs, roads & paths stop infiltration
More runoff: More
Soil
Low groundwater flow
No rain: streams dry up
Rain: streams flood
Bedrock

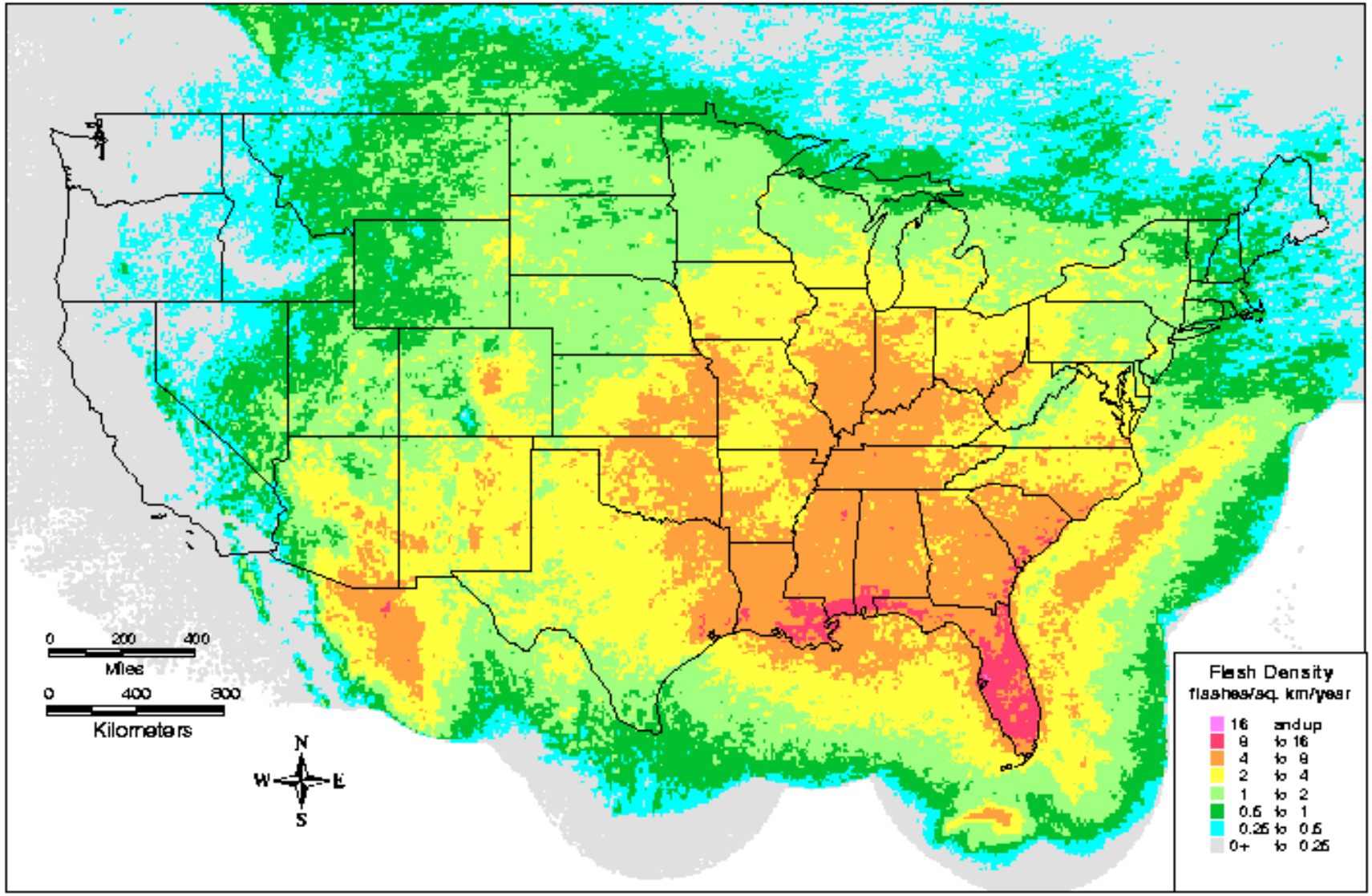
Terrestrial Systems



Main Driver of Terrestrial Systems - Prescribed Fire, Soils, & Hydrology

Lightning – The Natural Fire Starter

Lightning shaped the longleaf forest by igniting fires and creating gaps in the canopy where seedlings might get a start. It remains the largest cause of mortality in mature longleaf.



Global Atmospherics, Inc.
Fault Analysis and Lightning Location System

1996-2000 Flash Density Map

10 kilometer grid

Jan 1, 1996 00:00:00 GMT
To
Dec 31, 2000 23:59:59 GMT

Watershed Threats

- Invasive species in both aquatic and terrestrial systems
- Loss of native species including groundcover/aquatic vegetation
- Prescribed burning not occurring at a sustainable rotation
- Insufficient management/restoration equipment and staff
- Lack of monitoring of systems to allow for adaptive management
- Gaps in corridors/connectivity for wildlife
- Lack of understanding of compatible public uses/recreation. Not every use on every acre, complaint driven management
- Erosion/Sedimentation from dirt roads
- Insufficient outreach/education based on local systems and needs
- Groundwater contamination
- Altered population abundance – overharvesting
- Sea level rise

Watershed Threats

- Insufficient stormwater management
- Loss of Wetlands
- Shoreline Hardening
- Inappropriate removal of large woody material
- Non-point and point source pollution
- Poorly managed septic tanks
- Lack of buffers/riparian zones
- Culverts and bridges that block water flow/woody material
- Urban sprawl and associated increase in impervious cover
- Lack of investment/livability in urban/developed areas
- Inappropriate public uses in sensitive areas
- Insufficient enforcement of environmental rules and regulations
- Other Habitat loss (submerged aquatic vegetation, oyster reefs)
- Altered water chemistry (salinity)

Invasive Species - Chinese tallow tree Japanese climbing fern

IFAS

Corridors and Connectivity & Need for Additional Land Protection

- Provide for daily and seasonal movements of animals
- Facilitate dispersal, gene flow, and rescue efforts
- Allow for range shifts of species, as in response to climate change
- Maintain flow of ecological processes (i.e. fire, wind, sediments, water)
- Allows for human recreation and connectivity of urban, rural, and natural areas

Hilltop to Hilltop Paving

northescambia.com

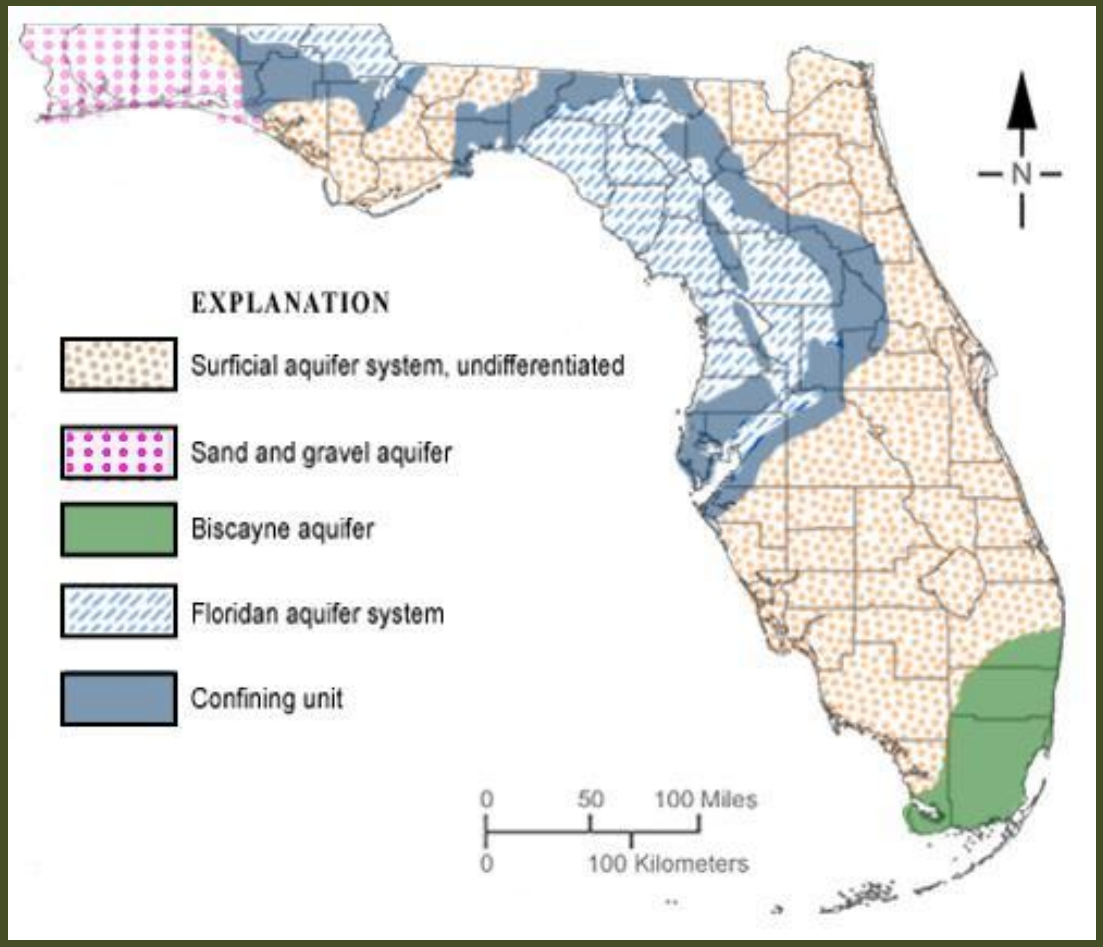
Low Water Crossing
Jones Road – Escambia County

northescambia.com

In-stream Bridge Supports Blocking Large Woody Material Movement

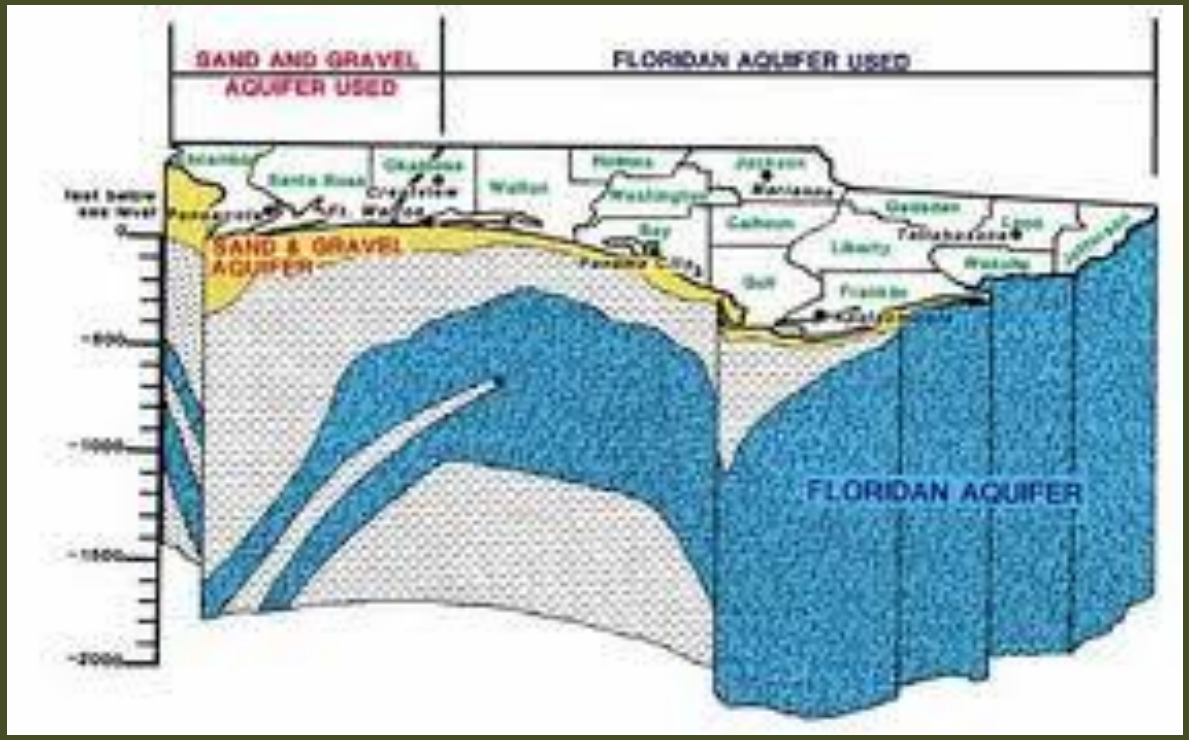
northescambia.com

Florida Aquifers



USGS

Northwest Florida Aquifers



NWFWMD

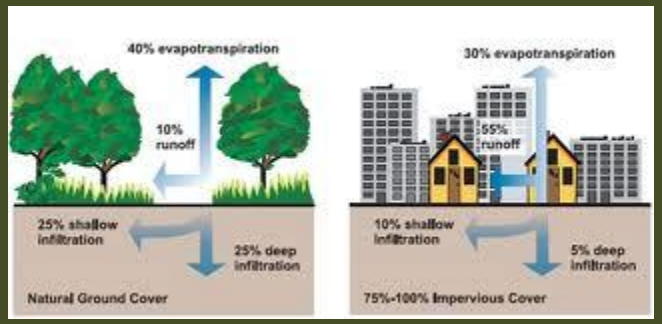
Hardened Shoreline versus Living Shoreline

Living Shoreline

PROJECT GreenShores

Stormwater Management

Stormwater Runoff

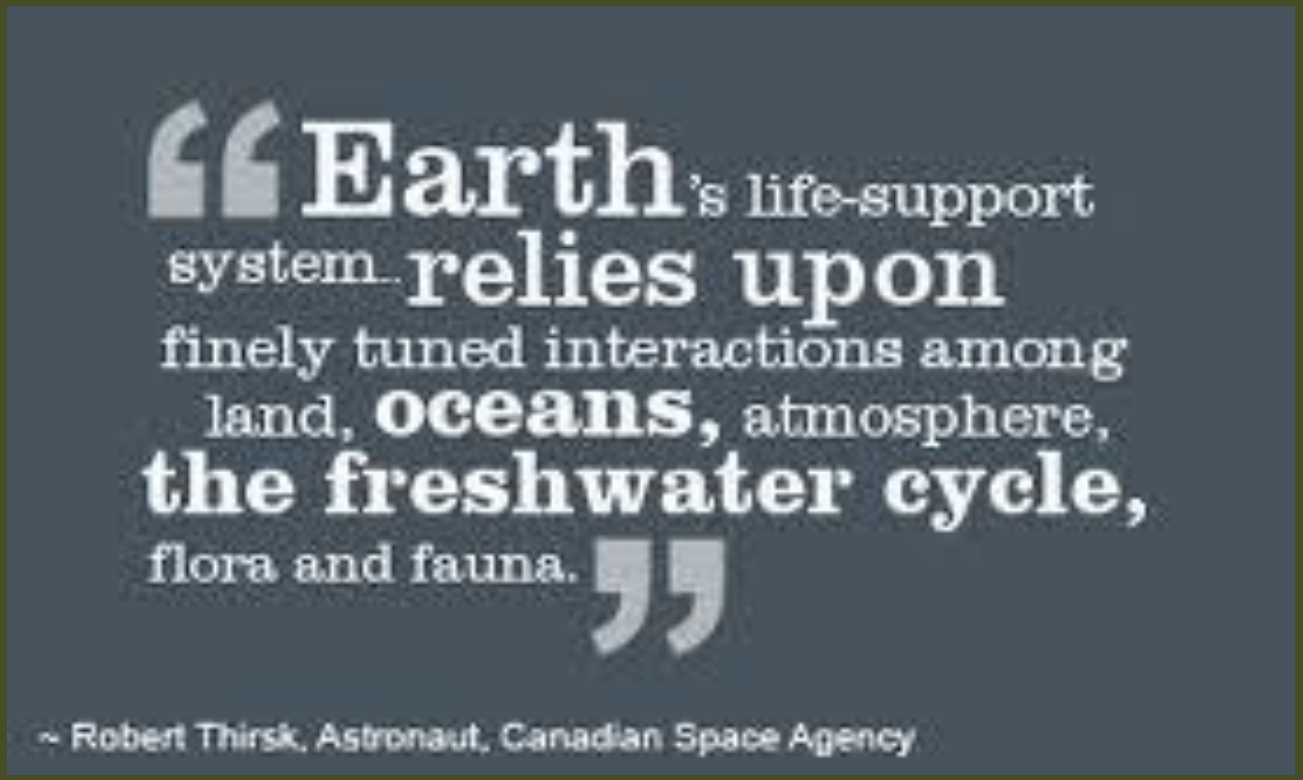


City of New Smyrna Beach

Area Examples

Criteria to Consider

- Addresses threats to species/habitats identified in local and/or state and federal conservation plans.
- Addresses species habitat needs through restoration of terrestrial and/or aquatic systems
- Provides for increased wildlife corridors and connectivity
- Addresses key ecological processes important to plant and animal species
- Assists in the recovery of rare species
- Improves Best Management Practices
- Addresses public education and outreach needs


“Earth’s life-support system relies upon finely tuned interactions among land, oceans, atmosphere, the freshwater cycle, flora and fauna.”
~ Robert Thirsk, Astronaut, Canadian Space Agency

Questions

Perdido River Nature Preserve
The Nature Conservancy