

**LACUSTRINE** - Non-flowing wetlands of natural depressions lacking persistent emergent vegetation except around the perimeter.

*\*Lacustrine communities are unchanged from the 1990 Guide*

### **Clastic Upland Lake**

**Description:** Clastic Upland Lakes are generally characterized as shallow to relatively deep, irregular- shaped depressions or basins occurring in uplands on clay substrates. They are lentic water bodies with surface inflows but often without significant outflows. Water is generally dissipated through evaporation and transpiration, but it may also disappear, especially during prolonged droughts, through sinks that connect with the aquifer.

Vegetation varies substantially in Clastic Upland Lakes. Some portions of the water's edge may be dominated by hydrophytic shrubs, such as buttonbush, Virginia willow, wax myrtle, St. John's wort, primrose willow, elderberry, white alder, black titi, swamp privet, Carolina ash, witchhazel, large gallberry, hurrah-bush, and possumhaw. Other shorelines may be vegetated with sedges, grasses, and rushes; or they may be dominated by hydrophytic trees, such as bald cypress, water hickory, water oak, laurel oak, water elm, sweetbay magnolia, redbay, sweetgum, waterlocust, red maple, loblolly bay, and black gum. Shallow water zones of Clastic Upland Lakes are generally densely vegetated by concentric bands of emergents, floating, and submersed aquatics, including pickerelweed, arrowhead, banana-lily, American lotus, spatterdock, fragrant water lily, coontail, watermilfoil, bladderwort, fanwort, and pondweed.

Typical animals include Florida gar, bowfin, threadfin shad, chain pickerel, golden shiner, ironcolor shiner, redeye club, yellow bullhead, brown bullhead, pirate perch, golden topminnow, lined topminnow, pygmy killifish, mosquitofish, least killifish, brook silverside, flier, Okefenokee pygmy sunfish, bluespotted sunfish, warmouth, bluegill, redear sunfish, largemouth bass, black crappie, swamp darter, two-toed amphiuma, newts, sirens, cricket frog, bullfrog, pig frog, leopard frog, alligator, snapping turtle, Florida cooter, yellow-belly turtle, mud turtle, stinkpot, Florida softshell turtle, mud snake, green water snake, banded water snake, eastern garter snake, cottonmouth, great blue heron, great egret, snowy egret, little blue heron, green-backed heron, white ibis, wood stork, kingfisher, beaver, and river otter.

Clastic Upland Lakes generally have clay and organic substrates. Their water is characteristically clear to colored, circumneutral to slightly acidic, and soft with a low mineral content (particularly sodium, chloride, and sulfate). Clastic Upland lakes may be oligo-mesotrophic, with relatively low nutrient levels, to eutrophic, with very high nutrient levels, depending upon their geologic age and nutrient supplements from the surrounding uplands.

Clastic Upland Lakes are important breeding areas for many terrestrial and semi-aquatic amphibians. They are frequently very important feeding and nesting areas for many wading birds, ducks, reptiles, and fish. Clastic Upland Lakes are vulnerable to hydrological manipulations which permanently lower the water levels and hasten successional processes, and those which prevent periodic dry-downs and hasten

eutrophication. They are also vulnerable to various activities in the surrounding uplands. Land clearing and timber harvests on the adjacent uplands generally increase sedimentation rates and, therefore, successional processes. Residential, agricultural, and industrial development within a lake's drainage basin generally increases pollution levels and accelerates eutrophication, which could be extremely detrimental to fish and other aquatic organisms. Human-related manipulations and activities within the drainage basin must be adequately controlled to avoid detrimental repercussions to these important communities.

**Global and State Ranks:** G3/S2

**Crosswalk and Synonyms:** clay-bottomed lake, silt-bottomed lake, fluctuating or disappearing lake, deep water lake, limesink

## **Coastal Dune Lake**

**Description:** Coastal Dune Lakes are generally characterized as shallow irregularly shaped or elliptic depressions occurring in coastal communities. They are generally permanent water bodies, although water levels may fluctuate substantially. They are typically lentic water bodies without significant surface inflows or outflows. Instead, water is largely derived from lateral ground water seepage through the surrounding well-drained coastal sands. Storms occasionally provide large inputs of salt water and salinities vary dramatically over the long term.

Vegetation may be largely restricted to a narrow band along the shore, composed of hydrophytic grasses and herbs or a dense shrub thicket, depending on fire frequency and/or water fluctuations. Shallow, gradually sloping shorelines may have much broader bands of emergent vegetation with submersed aquatic plants occasionally dominating much of the surface. Typical plants include rushes, sedges, marsh pennywort, cattail, sawgrass, water lilies, water shield, royal fern, marsh fleabane, marsh elder, salt myrtle, and black willow. Typical animals include mosquitofish, sailfin molly, alligator, mud turtle, saltmarsh snake, little blue heron, coot, and otter.

The substrate of Coastal Dune Lakes is primarily composed of sands with organic deposits increasing with water depth. Coastal Dune Lakes characteristically have slightly acidic, hard water with high mineral content, predominately sodium and chloride. Salinity levels often vary greatly, depending on local rainfall and storms. They are generally oligotrophic with low nutrient levels.

Coastal Dune Lakes develop from various coastal processes. They most commonly begin as a tidally influenced basin or lagoon that becomes closed by sand filling its inlet. Once isolated from the direct effects of tides, the water may become hypersaline, as salt water intrusion occurs readily through the sandy substrates, and the surface water evaporates rapidly. With further isolation from subsurface and overwash saltwater intrusion, the water gradually becomes less saline, but still varies considerably with local weather conditions.

Coastal Dune Lakes are very unusual coastal features, being relatively short-lived and likely to disappear rapidly. They are important breeding areas for many insects that form the base of numerous food chains. They may also be important watering holes for many mammals and birds inhabiting the surrounding xeric and coastal communities. Wading birds and ducks may also use these lakes as feeding and resting areas.

Coastal Dune Lakes are extremely vulnerable to hydrological manipulations. Excessive withdrawals of ground water could lower local water tables or increase salt water intrusion and, thus, induce successional responses in the lake basin. Groundwater pollution, especially from misapplications of chemicals on the surrounding coastal communities, could significantly alter the nutrient balance and produce devastating effects on the fauna and flora.

**Global and State Ranks:** G2/S1

**Crosswalk and Synonyms:** lagoon, sand-bottomed lake, silt-bottomed lake, oligotrophic lake, coastal lake

## **Coastal Rockland Lake**

**Description:** Coastal Rockland Lakes are characterized as "bare bottom" lacustrine systems of diminutive size with severely limited numbers and range (primarily confined to Monroe County). Lithophytic algae may occur sparsely on the limestone substrate that may be one of two types. In the Upper Keys from the northeast to approximately Big Pine Key, Miami limestone is prevalent, while west of this point a geologic shift to oolite occurs. The significance of this shift is not well known. Also characteristic of this community type are highly variable salinity ranges caused by saltwater intrusion and storm surges introducing saltwater into the system. The water is generally alkaline due to the limestone substrate and has a high mineral content.

Although this Natural Community is generally sparsely vegetated, it is critical in supporting an assortment of animals in the Keys. Typical animals associated with these communities include Florida Keys sheepshead minnow and Florida Keys sailfin molly. The rare Key deer and other terrestrial fauna are thought to be dependent on Coastal Rockland Lakes for drinking water. Coastal Rockland Lakes are generally surrounded by Marine Tidal Swamp, Pine Rockland, or Rockland Hammock, depending on the proximity to the shoreline and the elevation of the surrounding ground.

Management of these systems requires protection of the essential fresh groundwater lens that floats above the denser saline groundwater. Protection of the surrounding vegetated communities is also desirable to maintain the association between the terrestrial and avian fauna dependent on Coastal Rockland Lakes.

The primary threat to Coastal Rockland Lakes is development. Even limited use of the groundwater in the vicinity of this Natural Community may lead to elimination of the freshwater lens. Although less common than residential and commercial development in the Keys, rock mining activities occur in close proximity to Coastal Rockland Lakes and can destroy an entire cluster in a very limited time. The estimated number of Coastal Rockland Lakes thought to occur in Florida is very deceptive in that they are often clustered and the range is extremely limited. Therefore, detrimental activities at one location could eliminate as much as 10 to 20 percent of the total number of Coastal Rockland Lakes.

**Global and State Ranks:** G2/S1

**Crosswalk and Synonyms:**

## **Flatwoods/Prairie Lake and Marsh Lake**

**Description:** The distinctions between these communities, and from Depression Marsh, are often quite subtle, because of their successional interrelationships. Depression Marsh is characterized as a shallow, generally round or elliptical depression vegetated with concentric bands of hydrophytic herbaceous plants. Depending upon the depth and slope of the depression, an open water zone with or without floating plants may occur at the center. The open water zone is considered to be a Marsh Lake if it is small in comparison to the surrounding marsh. Otherwise, the system is considered to be a Flatwoods Lake or a Prairie Lake, depending upon the surrounding community.

Both Flatwoods Lake and Prairie Lake are surrounded by either a sparse, Wet Prairie-like zone or a dense ring of saw palmetto and other shrubs. Typical plants include spikerush, yellow-eyed grasses, St. John's wort, chain fern, coastal plain willow, maidencane, wax myrtle, water primrose, floating heart, buttonbush, fire flag, pickerelweed, arrowhead, bladderworts, bottlebrush threeawn, toothache grass, star rush, bulrushes, sawgrass, and nut sedge. Many animals utilize marshes primarily for feeding and breeding areas but spend most of their time in other habitats. Other animals are more dependent on marshes, spending most of their time within them. Typical animals include amphiuma, lesser siren, greater siren, cricket frog, green treefrog, bullfrog, pig frog, leopard frog, alligator, eastern mud snake, banded water snake, green water snake, striped crayfish snake, black swamp snake, American bittern, least bittern, great blue heron, great egret, snowy egret, little blue heron, tricolored heron, green-backed heron, black-crowned night-heron, white ibis, glossy ibis, bald eagle, northern harrier, king rail, Virginia rail, sora, limpkin, long-billed marsh wren, yellowthroat, red-winged blackbird, boat-tailed grackle, and Florida water rat.

The depressions in which these communities develop are typically formed by one of two geological processes: (1) solution holes form in the underlying limestone, causing surface sands to slump into a circular depression; or (2) during higher sea levels, offshore currents, waves, and winds scoured depressions that became seasonally or permanently inundated after the seas regressed. Soils in these depressions generally consist of acidic sands with some peat and occasionally a clay lens.

Water is derived mostly from runoff from the immediately surrounding uplands. These NC's function as aquifer recharge areas by acting as reservoirs which release groundwater when adjacent water tables drop during drought periods. Water generally remains throughout the year in a Flatwoods/Prairie Lake or a Marsh Lake, although water levels may fluctuate substantially.

**Global and State Ranks:** Flatwoods/Prairie Lake - G4/S3  
Marsh Lake - G4/S4

**Crosswalk and Synonyms:** Flatwoods pond, ephemeral pond, grass pond, St. John's wort pond, freshwater lake, pineland depression, swale, prairie pond

## **River Floodplain Lake and Swamp Lake**

**Description:** Swamp Lakes and River Floodplain Lakes are generally characterized as shallow open water zones, with or without floating and submerged aquatic plants, that are surrounded by Basin Swamp or Floodplain Swamp. They are generally permanent water bodies, although water levels often fluctuate substantially and they may become completely dry during extreme droughts. They are typically lentic water bodies occurring in confined basins or depressions. However, during floods or following heavy rains, they may exhibit decidedly lotic characteristics, flowing with the flood water or overflowing their banks into lower topographic areas. Some may even exhibit a slow perennial sheet flow, but water movement is generally so slow that lentic conditions prevail.

Except for the fringe of hydrophytic trees, shrubs and scattered emergents, plants may be absent altogether, or they may almost completely cover the water surface. When present, typical plants include fragrant water lily, banana lily, American lotus, spatterdock, duckweed, water meal, bog mat, water fern, dollar bonnet, frog's bit, water hyssop, water pennywort, coontail, milfoil, bladderwort, bog moss, and fanworts. Several exotic plants may also occur, including water lettuce, water hyacinth, salvinia, alligator weed, water spinach, parrot's feather, water chestnut, water sprite, hydrilla, and elodea. Scattered emergent plants such as lizard's tail, pickerelweed, slender spikerush and golden club may also occur, but the community will more appropriately be called Depression Marsh or Floodplain Marsh if emergents dominate the water body.

Typical animals include Florida gar, bowfin, redbfin pickerel, golden shiner, taillight shiner, lake chubsucker, brown bullhead, tadpole madtom, pirate perch, golden topminnow, pygmy killifish, mosquito fish, flier, blue spotted sunfish, bluegill, largemouth bass, swamp darter, mole salamander, two-toed amphiuma, Alabama waterdog, sirens, cricket frog, bullfrog, pig frog, river frog, leopard frog, alligator, snapping turtle, Florida cooter, yellow-belly turtle, eastern mud turtle, stinkpot, Florida softshell turtle, mud snake, redbelly water snake, banded water snake, brown water snake, cottonmouth, great blue heron, great egret, snowy egret, little blue heron, green-backed heron, white ibis, wood stork, kingfisher, beaver, and river otter.

The substrates of Swamp Lakes and River Floodplain Lakes are variable and may be composed primarily of peats, sands, alluvial clays, or any combination of these. Swamp Lakes characteristically have highly colored, acidic, soft water with moderate mineral content, while River Floodplain Lakes characteristically have colored, alkaline or slightly acidic, hard or moderately hard water with high mineral content (sulfate, chloride, calcium, magnesium). Both types are generally mesotrophic to eutrophic (i.e., have moderate to high nutrient levels and primary productivity), although they sometimes exhibit partial oligotrophic characteristics, with low nutrient levels and primary productivity, because their darkly stained, acidic waters and surrounding tree canopy limit their productivity.

Swamp Lakes may have originated from one or more of the following geological processes: (1) solution of the underlying limestone and subsequent collapse of the surface to form a depression; (2) lowering of sea levels to isolate ancient coastal features, such as lagoons or dune swales; or (3) isolation of ancient river systems within relatively

confined basins. River Floodplain Lakes generally originate along former stream channels as oxbows that have been isolated when new channels cut across a meander loop in the river, or along erosion scours formed by the tremendous forces of floodstage waters. They may also have been influenced by some of the processes that developed Swamp Lakes, or be the result of "nature's engineer", the beaver.

Swamp Lakes and River Floodplain Lakes are important breeding areas for many terrestrial and semi-aquatic amphibians. They are frequently very important feeding areas for many wading birds, ducks, and reptiles. They are also important nursery grounds and habitats for several species of fish. Swamp Lakes and Floodplain Lakes are extremely vulnerable to hydrological manipulations which lower the water levels and hasten successional processes. They are also vulnerable to land clearing and timber harvest operations within the surrounding swamps or adjacent uplands. Upland activities generally increase sedimentation, while activities within the swamp may increase insolation levels, alter nutrient levels and, in the case of Floodplain Lakes, increase the effects of flood scouring.

**Global and State Ranks:** River Floodplain Lake - G4/S2  
Swamp Lake - G4/S3

**Crosswalk and Synonyms:** cypress pond, gum pond, oxbow lake, backwater, blackwater lake or pond

## **Sandhill Upland Lake**

**Description:** Sandhill Upland Lakes are generally characterized as shallow rounded solution depressions occurring in sandy upland communities. They are generally permanent water bodies, although water levels may fluctuate substantially, sometimes becoming completely dry during extreme droughts. They are typically lentic water bodies without significant surface inflows or outflows. Instead, water may be largely derived from lateral ground water seepage through the surrounding well-drained uplands and/or from artesian sources via connections with the underlying limestone aquifer.

Vegetation may be largely restricted to a narrow band along the shore, composed of hydrophytic grasses and herbs or a dense shrub thicket, depending on fire frequency and water fluctuations. Shallow, gradually sloping shorelines may have much broader bands of emergent vegetation with submerged aquatic plants occasionally dominating much of the water column; floating plants sometimes cover much of the surface. Typical plants include panicums, rushes, bladderwort, water lilies, sawgrass, pickerelweed, fragrant waterlily, water shield, St. John's wort, arrowheads, beak rush, yellow-eyed grass, hatpins, meadow-beauty, sundews, and spikerush.

The substrate of Sandhill Upland Lakes is primarily composed of sands with organic deposits increasing with water depth. Sandhill Upland Lakes characteristically have clear, circumneutral to slightly acidic, moderately soft water with varying mineral content. They may be ultra-oligotrophic, with extremely low nutrient levels, seldom becoming eutrophic unless artificially fertilized by human-related activities.

Sandhill Upland Lakes are frequently extremely important breeding areas for terrestrial amphibians, including the threatened gopher frog, as well as many unusual or endemic insects. They are also important watering holes for many mammals and birds inhabiting the surrounding xeric communities. Wading birds and ducks may also use these lakes as feeding areas.

Sandhill Upland Lakes are extremely vulnerable to hydrological manipulations. Excessive municipal, industrial, or agricultural withdrawals of ground water could lower regional water tables and, thus, induce successional responses in the lake basin. Groundwater pollution, especially from misapplications of chemicals on the surrounding well-drained uplands, could significantly alter the nutrient balance and produce devastating effects on the fauna and flora. Furthermore, because they frequently have direct or indirect connections with the aquifer, Sandhill Upland Lakes often function as aquifer recharge areas and, thus, should be diligently protected from chemical pollution. Invasion by exotic species is also an important concern in Sandhill Upland Lake communities.

**Global and State Ranks:** G3/S2

**Crosswalk and Synonyms:** sand-bottomed lake, silt-bottomed lake, oligotrophic lake, sandhill lake



## **Sinkhole Lake**

**Description:** Sinkhole Lakes occur typically in deep, funnel-shaped depressions in a limestone base. Although the depression is relatively permanent, water levels may fluctuate dramatically. These lakes are characterized by clear, alkaline, hard water with high mineral content, including calcium, bicarbonate, and magnesium. Although they occur in most physiographic regions, the major occurrences of this NC in the U.S. are in Florida, where they are moderately widespread in the karst regions. They provide habitat for many species also found in accompanying subterranean NCs. The vegetation in some Sinkhole Lakes may be conspicuously absent or limited to a narrow fringe of emergents at the edge of the water. Other Sinkhole Lakes are completely covered by floating plants. When they occur, typical plants include American cupscale, bog moss, smartweed, rushes, cattails, bladderwort, duckweed, watermeal, azolla, and salvinia. Typical animals include crayfish, isopods, amphipods, pirate perch, redeye chub, yellow bullhead, and mud turtles.

Sinkhole Lakes are considered endangered in Florida. They are threatened by erosion which causes destruction of surrounding vegetation and to pollution and other threats to the aquifers with which they are connected.

**Global and State Ranks:** G3/S3

**Crosswalk and Synonyms:**