RIVERINE - Natural, flowing waters from their source to the downstream limits of tidal influence, and bounded by channel banks.

**Riverine communities are unchanged from the 1990 Guide*

Alluvial Stream

Description: Alluvial Streams are characterized as perennial or intermittent seasonal watercourses originating in high uplands that are primarily composed of sandy clays and clayey-silty sands. Because clay is a substantial component of these soils, surface runoff generally predominates over subsurface drainage. Thus, Alluvial Stream waters are typically turbid due to a high content of suspended particulates, including clays, silts, and sands, as well as detritus and other organic debris. Water temperatures may fluctuate substantially and are generally correlated with seasonal fluctuations in air temperature. Similarly, other water quality parameters vary substantially and generally fluctuate with seasonal rainfall patterns.

The most important characteristics of Alluvial Streams are the large range of flow rates and sediment loads encountered. Thus, water depth fluctuates substantially and is generally separated into two distinct stages, a normal or low flow stage and a flood or high flow stage. During the normal low flow stage the water is confined within the stream banks, while during flood stage the water overflows the banks and inundates the adjacent floodplain communities. Flood stages generally occur once or twice each year during winter or early spring and occasionally in summer.

Several important phenomena occur during floodstage. The flood waters transport detritus, minerals and nutrients from the surrounding uplands to the floodplain communities and beyond. This flushing action removes biological waste materials and simultaneously renourishes the floodplain communities. Most important, however, it provides a pulse of nutrient-rich water to the estuarine communities which occur where the stream empties into the sea. As the water spreads and moves more slowly over the broad floodplain communities, the heavy load of sediments, which was suspended by water currents, begins to settle. The heaviest sediments settle rapidly where the stream overflows its banks, causing a natural levee to develop. The flood waters are a controlling factor in the reproductive cycles of many Aquatic and semi-aquatic organisms. The onset of flooding, or its subsequent regressions, stimulates some animals to breed and lay eggs, or it may induce the hatching of eggs and the development of larvae. The flood stage waters expand the feeding grounds and habitat of fish and other aquatic organisms that normally inhabit the main stream. The flood waters function as a primary dispersal mechanism for many organisms, transporting seeds and small animals to distant locations where they otherwise would probably not reach.

Very few rooted plants occur within the main channel of Alluvial Streams, largely because the high natural turbidity reduces available light for photosynthesis. Water lilies, spatterdocks and other floating-leaved plants occasionally occur along quiet stretches, while pickerelweed, cattails, and other emergents may fringe the banks. Willows, cottonwood, river birch, silver maple, and other trees typically occur along the banks and natural levees. Typical animals include eel, gizzard shad, speckled chub, madtom, pirate perch, striped bass, redbreast sunfish, warmouth, bluegill, crappie, darter, Alabama

waterdog, river frog, alligator, snapping turtle, alligator snapping turtle, Florida cooter, river cooter, mud turtle, stinkpot, brown water snake, kingfisher, Louisiana waterthrush, beaver, and river otter.

Alluvial Streams are sparsely distributed in Florida, being primarily restricted to the northern panhandle. Nearly all have been degraded to some degree by disturbances within their watersheds. More serious damage can occur through physical alterations of their main channels, such as dredging, filling or damming. Damming poses the most serious threat, because it disrupts the natural flood cycle, traps upstream nutrients, and can lead to permanent loss of the floodplains due to longterm flooding of areas upstream of the dam. The adjacent floodplain communities are an essential and interrelated component of a viable Alluvial Stream community.

Global and State Ranks: G4/S2

Crosswalk and Synonyms: alluvial river, slow flowing river, deep river, muddy stream

Blackwater Stream

Description: Blackwater Streams are characterized as perennial or intermittent seasonal watercourses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and discharging it slowly to the stream. The tea-colored waters of Blackwater Streams are laden with tannins, particulates, and dissolved organic matter and iron derived from drainage through swamps and marshes. They generally are acidic (pH = 4.0 - 6.0), but may become circumneutral or slightly alkaline during low-flow stages when influenced by alkaline groundwater. Water temperatures may fluctuate substantially and are generally correlated with seasonal fluctuations in air temperature. The dark-colored water reduces light penetration and, thus, inhibits photosynthesis and the growth of submerged aquatic plants. Emergent and floating aquatic vegetation may occur along shallower and slower moving sections, but their presence is often reduced because of typically steep banks and considerable seasonal fluctuations in water level. Typical plants include golden club, smartweed, sedges, and grasses. Typical animals include river longnose gar, gizzard shad, threadfin shad, redfin pickerel, chain pickerel, ironcolor shiner, Ohooppee shiner, weed shiner, blacktail shiner, chubsucker, channel catfish, banded topminnow, pygmy killifish mosquitofish, mud sunfish, flier, everglades pygmy sunfish, banded sunfish, redbreast sunfish, dollar sunfish, stumpknocker, spotted bass, black crappie, darters, Alabama waterdog, river frog, alligator, snapping turtle, alligator snapping turtle,river cooter, Florida cooter, peninsula cooter, stinkpot, spiny softshell, red-belly watersnake, brown watersnake, beaver, and river otter.

Blackwater Streams have sandy bottoms overlain by organics and frequently underlain by limestone. Limestone outcrops may also occur. Blackwater Streams generally lack the continuous extensive floodplains and natural levees of Alluvial Streams. Instead, they typically have high, steep banks alternating with Floodplain Swamps. High banks confine water movement except during major floods. The absence of significant quantities of suspended sediments reduces their ability to construct natural levees.

Blackwater Streams are the most widely distributed and numerous Riverine systems in the southeast Coastal Plain. Very few, however, have escaped major disturbances and alteration. Clearcutting adjacent forested lands is one of the more devastating alterations for this community. Additionally, the limited buffering capacity of Blackwater Streams intensifies the detrimental impacts of agricultural and industrial effluents.

Global and State Ranks: G4/S3

Crosswalk and Synonyms: blackwater river, blackwater creek

Seepage Stream

Description: Seepage Streams are characterized as perennial or intermittent seasonal water courses originating from shallow ground waters that have percolated through deep, sandy, upland soils. Seepage Streams typically have clear to lightly colored water maintained at fairly constant temperatures of around 70°F, and are relatively short, shallow, and narrow. Although a stream may be classified as a Seepage Stream along its entire length, they also form the headwaters of many Alluvial and Blackwater Streams. After large sediment loads are picked up or after drainage through extensive swamps, water clarity is diminished and the stream is then classified as Alluvial or Blackwater.

Because they are generally sheltered by a dense overstory of broad-leaved hardwoods which block out most sunlight, Seepage Streams most often have depauperate aquatic floras. Filamentous green algae occur sporadically within the stream, while mosses, ferns and liverworts may grow in clumps at the water's edge. In the lower, broader reaches where insolation levels are sometimes greater, narrow bands of spatterdocks, golden club, spikerush and pondweeds may occur along the shorelines, and tape grass and pondweed may grow in the streambed. Typical animals include sailfin shiner, creek chub, speckled madtom, brown darter, blackbanded darter, amphiuma, Alabama waterdog, southern dusky salamander, two-lined salamander, mud salamander, southern red salamander, bronze frog, snapping turtle, loggerhead musk turtle, rainbow snake, redbelly watersnake, and brown watersnake.

Percolation through deep soils slows the release of rainwater, filters the water, and buffers temperature extremes. Thus, Seepage Streams often exhibit perennial, slow flow rates of clear, cool, unpolluted water. Seepage Streams generally have sandy bottoms, although clays, gravel and limestone may be prevalent along stretches where formations composed of these sediments are exposed. Additionally, deep organic deposits may accumulate near stream bends and in other low areas where the leaf litter is not washed away by currents.

Seepage Streams are generally confined to portions of the state where topographic relief is pronounced, especially in northern Florida. They are often associated with Seepage Slope and Slope Forest near their head waters, and Bottomland Forest, Floodplain Forest and Swamp Forest near their mouths. Seepage Streams are readily distinguished from other Florida stream communities by their small magnitude, lack of a deep aquifer water source, and the absence of extensive swamp lowlands surrounding their head waters.

A unique type of Seepage Stream, the steephead stream, develops by a rather unusual geologic process. Rainfall percolates through the deep sandy soils capping the surrounding uplands until it encounters impermeable clays or other non-porous sediments. Water then travels laterally until reaching the surface and producing a seepage area along a slope or a spring. The seepage waters begin to erode the hill's base and cause the overburden to slump. Thus, the steephead stream valley is largely a product of seepage erosion which begins primarily at the bottoms of valleys instead of at their tops. Consequently, the gradient of steephead streams is generally much lower than that of other upland streams in similar topography, because the head of a steephead stream is already near the bottom of a valley.

Seepage Streams may be threatened by various activities. Applications of fertilizers or biocides on the surrounding uplands, or dumping of hazardous wastes and other refuse within the drainage basin could pollute the shallow ground waters that feed the Seepage Streams. Deforestation of the surrounding slopes could increase surface erosion and cause excessive sedimentation of the stream valley, as well as increase insolation levels and cause the stream to become overgrown with shrubs or emergent herbaceous species. Impounding the stream would destroy much of the lotic habitat and restrict the upstream movements of aquatic animals. Because they are unique natural features of limited distribution within the state, Seepage Streams should be diligently protected from significant disturbances.

Global and State Ranks: G3/S2

Crosswalk and Synonyms: steephead stream, clear brook, swift brook, hammock stream

Spring-run Stream

Description: Spring-run Streams are characterized as perennial water courses which derive most, if not all, of their water from artesian openings in the underground aquifer. Waters issuing from the aquifer are generally clear, circumneutral to slightly alkaline (pH=7.0-8.2), and perennially cool (66-75°F). These conditions saturate the water with important minerals, allow light to penetrate deeply, and reduce the limiting effects of environmental fluctuations, all of which are conducive for plant growth. Thus, Spring-run Streams are among the most productive aquatic habitats. Typical plants include tape grass, wild rice, giant cutgrass, arrowheads, southern naiads, pondweeds, and chara. Typical animals include mollusks, stoneflies, mayflies, caddisflies, simuliids, chironomids, American alligator, alligator snapping turtle, Suwannee cooter, loggerhead musk turtle, rainbow snake, red-belly watersnake, brown watersnake, and many fishes.

Spring-run Streams generally have sand bottoms or exposed limestone along their central channel. Calcareous silts may form thick deposits in quiet shallow zones, while leaf drift and other debris collect around fallen trees and quiet basins. The latter, along with limestone outcrops and rock debris, form important aquatic habitats for many small aquatic organisms. When undisturbed, submerged aquatic vegetation clothes most of the spring-run stream bottom and provides shelter and an abundant food source for the extensive web of life.

The water emanating from the aquifer is generally clear because of the filtering and absorbing actions of the soils and aquifer limestones through which the water percolates and flows. When the water is deep, it may appear bluish because of light-refraction characteristics that are similar to those which cause the sky to be blue on clear days. If the water sources for the aquifer are substantially influenced by nearby swamps or flatwoods, the spring-run may temporarily become stained with tannins and other dissolved organics during or following periods of heavy rains. When extensive underground cavities connect the spring caverns with nearby sinks and swallow holes, the spring-run may become turbid with suspended particulates during and following heavy rains and floods. Conversely during periods of low rainfall, the aquifer can become supersaturated with calcium, carbonates, and other ions. These chemicals readily precipitate when the water reaches the surface, causing the spring head or boil to appear milky.Human activities affect flow rates by withdrawing water from the aquifer through deep wells. When withdrawal is substantial within the recharge area, spring flow is reduced or, in some cases, ceases entirely. Normal flow rates may return when excessive withdrawals are eliminated.

People can also substantially affect the quality of spring waters. Agricultural, residential, and industrial pollutants may readily leach through soils, especially when they are improperly applied or disposed. If polluted groundwater infiltrates the deep aquifer feeding a Spring-run Stream, recovery may not be possible. Applications of herbicides to control aquatic plant growth are also detrimental, because their use often induces eutrophication of the stream.

Other human-related impacts to Spring-run Streams include the destruction of aquatic vegetation by overuse or misuse, and the introduction and proliferation of exotic plants and animals. Both of these impacts may be very difficult to control. Overuse is likely to

increase because of the limited number of publicly-owned springs and the desires of an increasing population to enjoy their clean, cool, aesthetic qualities and unique recreational opportunities. Exotic species are often severely detrimental to native species, and they may also disrupt recreational activities. A delicate balance between recreation and preservation must be sought.

Global and State Ranks: G2/S2

Crosswalk and Synonyms: calcareous stream, spring, or creek