Guana Tolomato Matanzas National Estuarine Research Reserve (St. Johns County) Photo by Katy NeSmith

Coastal Strand

Description: Coastal strand is an evergreen shrub community growing on stabilized coastal dunes in the peninsula of Florida, often with a smooth canopy due to pruning by salt spray. It usually develops as a band between dunes dominated by sea oats (*Uniola paniculata*) along the immediate coast, and maritime hammock, scrub, or tidal swamp communities further inland. On broad barrier islands or prograding coasts, it may also occur as patches of shrubs within a coastal grassland matrix.

Along the Atlantic coast, species composition of coastal strand changes from north to south. Temperate species dominate from the Georgia border south to Cape Canaveral, with dense saw palmetto (*Serenoa repens*) and scattered dwarfed cabbage palm (*Sabal palmetto*) on the seaward edge, which are gradually joined inland by taller shrubs, including tough bully (*Sideroxylon tenax*), yaupon (*Ilex vomitoria*), Hercules' club (*Zanthoxylum clava-herculis*), and dwarfed, shrubby forms of red bay (*Persea borbonia*), red cedar (*Juniperus virginiana*), and live oak (*Quercus virginiana*; Johnson and Muller 1993b). From Canaveral southward tropical species become more prevalent including seagrape (*Coccoloba uvifera*) nearest the coast, joined further inland by Florida swampprivet (*Forestiera segregata*), myrsine (*Rapanea punctata*), buttonsage (*Lantana involucrata*), white indigoberry (*Randia aculeata*), snowberry (*Chiococca alba*), Spanish stopper (*Eugenia foetida*), blolly (*Guapira discolor*), wild lime (*Zanthoxylum fagara*) Florida Keys blackbead (*Pithecellobium keyense*), coco plum (*Chrysobalanus icaco*), coinvine (*Dalbergia ecastaphyllum*), yellow necklacepod (*Sophora tomentosa var truncata*), and gray nicker (*Caesalpinia bonduc*; Johnson et al. 1992).

Along the southwest coast, where prevailing winds are from the east and therefore do not blow across the water, coastal strand generally does not exhibit the low, even, spray-pruned profile seen on the Atlantic coast. Many of the same tropical species found on the east coast occur here, plus joewood (*Jacquinia keyensis*); saffron plum (*Sideroxylon celastrinum*), of limited occurrence on the east coast, is common here (Johnson et al. 1992).

Soils are deep well-drained sands and may be somewhat alkaline, consisting of quartz sand mixed with varying proportions of shell fragments (e.g., Palm Beach sand).

Characteristic Set of Species: saw palmetto, cabbage palm, tough bully, red bay, and live oak are characteristic of temperate coastal strand; seagrape, myrsine, buttonsage, and Florida Keys blackbead characterize tropical coastal strand.

Rare Species: Rare plant species found in coastal strand include Simpson's prickly apple (*Harrisia simpsonii*) on the Atlantic coast and joewood (*Jacquinia keyensis*), plus the highly endangered aboriginal prickly apple (*Harrisia aboriginum*) on the west coast. Species found in openings in coastal strand include coastal vervain (*Glandularia maritima*), Atlantic coast Florida lantana (*Lantana depressa* var. *floridana*), and beach jacquemontia (*Jacquemontia reclinata*) on the Atlantic coast, joewood (*Jacquinia keyensis*), and Gulf coast Florida lantana (*Lantana depressa* var. *sanibelensis*) on the west coast. Among rare animals, gopher tortoises (*Gopherus polyphemus*) are common in this community.

Range: In Florida, coastal strand is relatively continuous along the sandy portion of the Atlantic coast, patchily distributed on the southwest Gulf coast, and absent on the Florida Panhandle coast where the transition zone is occupied by scrub or coastal grassland communities (Johnson and Muller 1993a). Outside of Florida, coastal strand continues north to South Carolina, although continuous band of shrubs dominated by saw palmetto and cabbage palm are found only on the narrower barrier islands in Florida. To the west, the coasts of Alabama and Mississippi, like the Panhandle, have scrub and coastal grassland communities, rather than coastal strand, interpolated between the sea oats dune above the beach and the more stable inland communities

Natural Processes: Due to its coastal location with water barriers on at least one, if not two sides**,** fire was probably naturally rare and very spotty in coastal strand, especially on the narrower barrier islands. Disturbance to coastal strand is primarily caused storm waves, sand burial, and wind-borne salt spray. If storm waves destroy or diminish the protective dunes seaward of coastal strand, sand can be blown or be carried by water inland, burying the shrubs. Salt spray from both the ocean and bay sides of islands can enter and kill the upper buds, producing smooth, "pruned" canopies of evenly increasing height away from the coast (Boyce 1954).

Community Variations: In addition to north-south variation discussed above, species composition differs between the Atlantic and Gulf coasts. Coastal strand in Lee County on the west coast is characterized by joewood which does not occur in this community on the Atlantic coast; coastal strand on the east coast from Brevard to Palm Beach counties may be dominated by Simpson's stopper (*Myrcianthes fragrans*), which is rare on the west coast (Johnson et al. 1992; Johnson and Muller 1992).

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Associated Communities: Coastal strand may be distinguished from scrub by the presence of short-statured live oak, calciphilic species such as cabbage palm and Hercules' club, or the presence of tropical shrubs in the southern portion of the state. Coastal strand lacks characteristic scrub oaks such as myrtle oak (*Q. myrtifolia*), Chapman's oak (*Q. chapmanii*), and sand live oak (*Q. geminata*), as well as Florida rosemary (*Ceratiola ericoides*). The two communities may occur on adjacent ridges in parts of St. Johns, southern Brevard and northern Palm Beach counties, where older ridges of acid quartz sand (e.g. Welaka sand) support scrub just inland from younger deposits of quartz sand mixed with shell (e.g. Palm Beach sand; Huckle et al. 1974) that support coastal strand. Both communities look very similar, since they are dominated by shrubby oak species and are spray-pruned by sea winds. However, in coastal strand, dwarfed live oak (*Quercus virginiana*) predominates, and in scrub, sand live oak (*Q. geminata*) predominates. The difference between scrub and coastal strand in this region is most apparent in April, when the scrub will still appear dark green from the old leaves of the sand live oak, while the coastal strand is light green from the new leaves of live oak, which leafs out earlier than sand live oak.

Coastal strand is distinguished from maritime hammock by the absence of distinct tree canopy and understory layers. It is distinguished from coastal berm and shell mound by its occurrence on sand deposits along a high-energy sandy coast, rather than on a shell deposits along a low-energy, mangrove-dominated coast. It is distinguished from coastal grassland by the dominance of woody, rather than herbaceous species.

Management Considerations: Natural fires would be of limited extent in this community due to water barriers, prevailing onshore winds on the east coast, and the sparse vegetative cover of surrounding grassland communities on the west coast. By opening up the canopy, fires may make coastal strand shrubs more susceptible to other stresses, such as storms or winter freezes. Chopping, burning, or clearing coastal scrub or strand seaward of hammocks exposes the canopies of taller maritime or xeric hammock to increased salt spray, and may lead to increase salt pruning or death of canopy trees. This is an important consideration because xeric and maritime hammocks along the coast are important resting and feeding sites for migrating songbirds (Cox 1988).

Invasion by exotic plants, such as Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), latherleaf (*Colubrina asiatica*), beach naupaka (*Scaevola taccada*), Burma reed (*Neyraudia reynaudiana*), and carrotwood (*Cupaniopsis anacardioides*) following natural disturbance is an ongoing threat. Although disturbance is a natural process on the coast and native species are presumably adapted to colonize after disturbance, Australian pine can grow taller, closer to the coast, than any native species, thereby pre-empting succession from coastal strand to native hammocks (Johnson 1994). Australian pine has been removed at a number of sites including Keewaydin Island, Don Pedro Island State Park, Lovers Key, Hutchinson Island, and St. Lucie Inlet State Park. Re-colonization by native woody species should not be interfered with since the native colonizers help to deter re-invasion by exotics. Areas where Australian pine is removed require monitoring and re-treatment (spot herbicide or hand pulling) to prevent reinvasion, especially until native species become well-established.

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Red bay in temperate coastal strand communities has been affected by Laurel Wilt Disease, which is caused by a fungus spread by an exotic wood-boring beetle (*Xyleborus glabratus*) and is fatal to shrubs over 1 inch dbh. Infestations were first discovered in Duval County in 2004 and, by 2009, had spread to Nassau County and southward down the coast as far as St. Lucie County (USFS 2009). As of 2009, there were no known means of treating diseased trees or controlling the spread of the disease. Wood or mulch from dead infected trees should not be transported to avoid creating new centers of infection. This includes the transport of firewood into, or near, coastal strand for the purposes of outdoor recreational fires (campfires, bonfires).

Reference Sites: Guana Tolomato Matanzas National Estuarine Research Reserve – Guana site (formerly Guana River State Park; St. Johns County); Canaveral National Seashore (Volusia/Brevard County); Hollywood North Beach Regional Park (Broward County); Cayo Costa State Park (Lee County)

Global and State Rank: G3/S2

Crosswalk and Synonyms:

Kuchler	90/Live oak - Sea oats
Davis	1/Coastal Strand (in part)
SCS	1/North Florida Coastal Strand
	2/South Florida Coastal Strand
Myers and Ewel	Dunes and maritime hammock-coastal scrub
SAF	N/A
FLUCCS	322/Coastal Scrub
	426/Tropical Hardwoods
Whitney	beach dune systems

Other synonyms: saw palmetto shrubland (Rutchey et al. 2006); scrub zone (Kurz 1942); cactus thickets, shore hammocks (Harper 1927); maritime shrub community (Bellis 1995)

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Canaveral National Seashore (Volusia County) Photo by Ann F. Johnson

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