Chapter 2: SITE DESCRIPTION

The River and Floodplain

The Sittee River is located in central Belize in the Stann Creek District between North Stann Creek and South Stann Creek. It is a sixth order stream (Harrell 1992, Latchum 1992) that drains into the Caribbean Sea from the Cockscomb Range of the Maya Mountains. It arises along the elevational divide, north of Victoria Peak (the highest point in Belize at 3680 feet or 1122 meters), and flows east to the ocean. The length of the river is approximately 50 km with 32 km in the mountains and 18 km in the coastal plain. The gradient through the mountains is 23 m/km and through the coastal plain the gradient is 7 m/km. The study area covers most of the river length in the coastal plain, below Kendal Bridge on the Southern Highway to the Caribbean Sea (Figure 2-1). Over this portion the river has a meandering course and only two major tributaries, Boom Creek which is a brackish, blackwater stream and Fanny Young Creek which has several springs that had been used by local people for freshwater during the dry season. The lack of drainage density in the coastal plain suggests the importance of internal drainage in this portion of the watershed. Habitats in the lower portion of the river include the main channel, pool and riffle sequences, forested banks of mangroves, bamboo clumps or tropical hardwoods, eroded banks with exposed clay slopes, sloughs, sandy beaches and adjacent pools. The most common substrate type in the river is a clay-silt bottom but cobble bottomed riffles and runs occur towards the upper end of the study area and a sandy bottom is found at the river mouth.

The region which includes the Sittee River watershed has been classified by Hartshorn et al. (1984) as tropical moist forest transition to subtropical in the Holdridge Life Zone System (Holdridge 1967) and by Escoto (1964) as tropical rainforest (Af) in the Koppen Climate System. Little rainfall data is available for the study area, but Standley and Record (1936) report a three year average rainfall of 2443 mm (96.16 inches) for Kendal in the coastal plain and general meteorological data for the country show that rainfall in the study area is greater than 2000 mm per year, which is characteristic of a rainforest climate. Rainfall data was gathered in the Jaguar Preserve of the Maya Mountains for 1990 and it totaled 4452 mm (175.26 inches) for the year (Ernesto Sequi, Belize Audubon Society, Personal Communication). The rainfall distribution is highly seasonal with a marked dry season during the late winter-early spring (especially February-May). No hydrologic data could be found for the Sittee River except for that given by Hartshorn et al. (1984) who state the watershed above Kendal covers 474 km2 and the Sittee River at Kendal has an annual discharge of 13.9 m3/sec.

The region, which includes Sittee River, has been termed the Maya Forest (Fedick 2003, Primack et al. 1998) in reference to the tropical rain forest biome of Mesoamerica that was historically occupied by the Maya people. More specifically, the general forest type of the study area has been referred to with a variety of descriptions including high rain forest (Standley and Record 1936), luxuriant tropical rain forest (Lundell 1945) and semi-evergreen tropical forest (Penn et al. 2004). This forest is dominated by hardwoods and palms and it covers most of the land area in the Maya Mountains. However, the coastal plain is characterized as a pine savanna, dominated by scattered Caribbean pine (Pinus caribaea) and a grassland understory. This savanna is an edaphic formation,

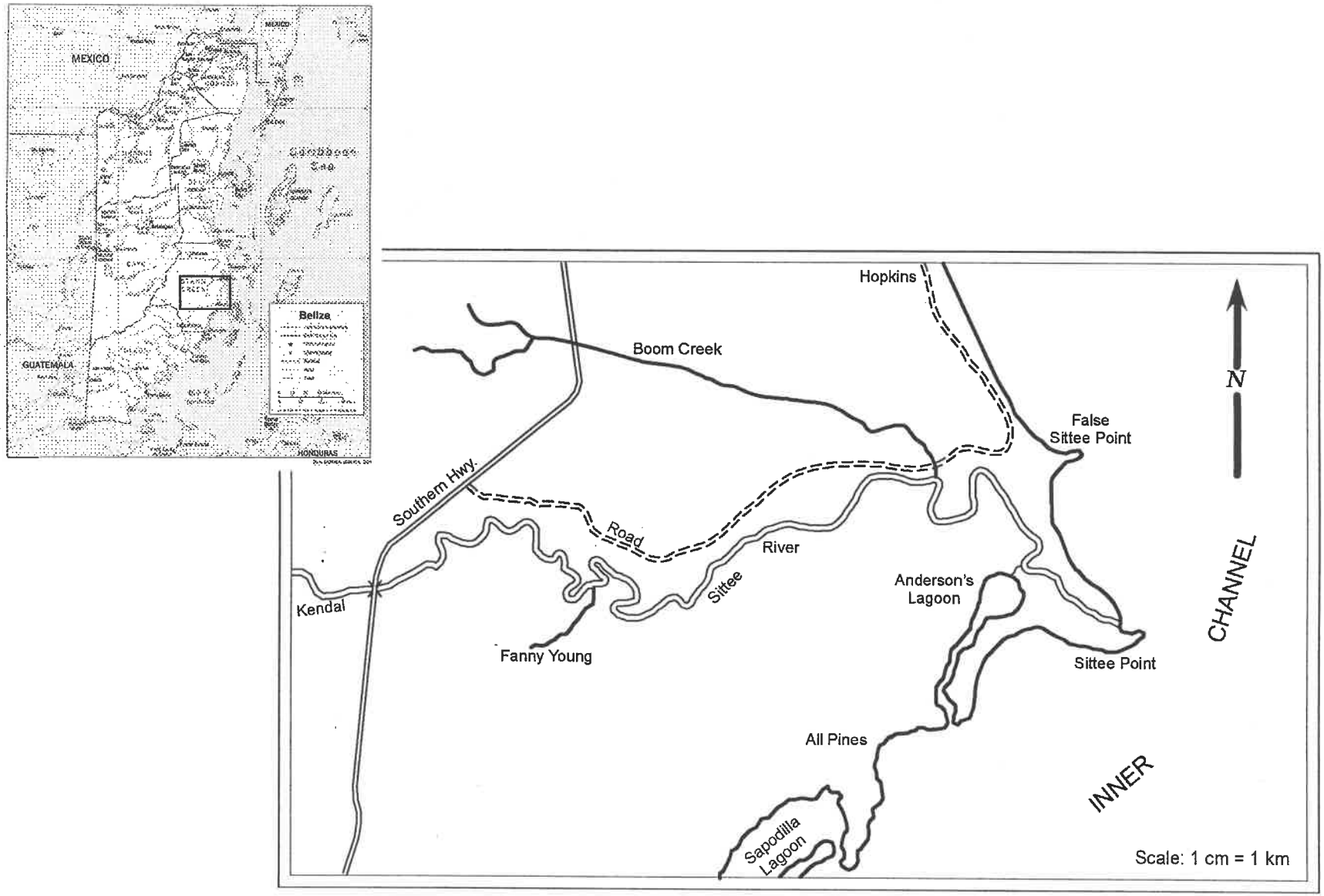

Figure 2-1. Location of the study area along the lower portion of the Sittee River in central Belize.

caused by the soil and geology rather than the climate, which favors rapid infiltration. Because of this condition, fires are common during the dry season in the savanna. The rain forest vegetation extends through the pine savanna as a riparian forest on the floodplains of the rivers that drain the mountains and this is the situation throughout the study area of this book.

The river and its riparian forest have been intact at least since the 1880s when Morris (1883) gave the following description on a trip upriver along the Sittee:

"After leaving the settlements, the scenery becomes essentially tropical and luxuriant: passing now between deep, richly clothed banks and cliffs, which sometimes shut out the strong rays of the sun, we suddenly emerge into open and almost level country, with low, rush-fringed banks, dotted here and there with tall-growing figs and the ubiquitous trumpet-tree. Further inland there would be a 'pine-ridge', with its clumps of 'pitch pine' and 'pimento palms', isolated by vast stretches of grassy savannahs.

We would next pass through a densely-wooed forest consisting of mahogany, cedar, rosewood, etc. with the characteristic vegetation of a 'cohune ridge', which extending for a greater or less distance on each side of the river would indicate the richest land of the colony.

On the Sittee River as on the Mullin's River, the upper portions of their respective valleys have magnificent tracts of 'cohune ridge', which are admirably adapted for the successful cultivation of most tropical plants. . .

The river banks are clothed chiefly with melastomads and caliandras, which form a low fringe of a shrubby character: in most situations the wild cane (Arundo) and aquatic grasses exist as dense, tall-growing thickets, close to the water's edge. Here and there are fine handsome trees of wild fig overhanging the river, and in some cases with their huge spreading branches resting almost on the surface of the water. Other trees noticed were, salmwood and quamwood, the latter in abundant flower, and scenting the air for miles round. Numerous trees were completely covered by the rattan cane (Desmoncus), which on account of its formidable recurved spines formed an impenetrable barrier to both man and beast."

Although the forests along the Sittee River may not have changed much over the last 100 years, development is increasing and the forest is being transformed into land use. However, unlike many places in the Neotropics, the environment along Sittee River in general is not an "empty forest" (Redford 1992) and has not undergone "defaunation" (Dirzo and Miranda 1990) but rather it is full of large animals that function in the local food webs. For example, there is a reproducing population of crocodiles in the river, as evidenced by the continual presence of juvenile and adult sized individuals. Furthermore, 26 species of mammals (not counting bats) are commonly seen in the area (Appendix 2-1) including four species of large cats (jaguarondi, margay, ocelot and jaguar). Dangerous snakes, such as the fer-de-lance and coral snakes, are also a part of the local fauna and students in the travel-study courses are always warned to be cautious of them. This presence of large animals not only indicates the high environmental quality of the landscape (Terborgh 1988) but it suggests that hunting activities by local people are limited, either directly or indirectly, by social mechanisms that create a diverse and, at least to some extent, harmonious system of humans and Nature along the Sittee River.

The Village

As noted earlier, the Sittee River and its watershed have been occupied and used by humans at least since the Maya civilization dominated middle America from 300 -900 AD during their Classic Period and into the Postclassic Period. Thompson (1988) reports the Spanish established a town to control the local Maya on the Sittee River in the 1600s and that it was plundered and destroyed by a Dutch corsair in 1641. According to Spanish records, the Maya called the river Soyte (perhaps after the common name of a medicinal shrub found along the river bank), which was later changed to the Sittee by the English (Thompson 1988). Logwood may have been harvested along the Sittee by the English baymen in the 1700s but mahogany certainly was cut throughout the early history of the British colony. During the mid to late 1800s the lower Sittee River watershed seems to have been mostly deforested and converted to sugar cane plantations. Evidence of this land use is the remains of at least three abandoned, steam-powered sugar mills that have been covered over by forest growth. These mills (Serpon, Regalia and an unnamed site on Boom Creek) may have been part of one large complex that was tied to the port town that once existed at All Pines on the Caribbean. The last published record of historical use of the Sittee River comes from World War II. 2,000 lbs. (907 kg) of natural rubber was collected from forests along the river to contribute to the British war effort, since rubber from southeast Asia was cut off by the Japanese (Bowman 1979).

The current population is concentrated in two towns on the Sittee River. According to local residents about 350 people live in Sittee River village, which is composed of three communities (High Sand, Middle Bank and Freetown) and about 50 people live in Kendal. The majority of the people in Sittee River are Creoles, which is one of the main cultures represented in Belize. Creoles are people of African origin, primarily descendants of slaves who were brought to work in mahogany extraction or later in the sugar cane plantations (Booland 2003). The Creoles have not received as much attention as the Black Caribs (Crawford 1984, Gonzalez 1969), but there are some similarities between the two cultures. In general, they have more affinities with the peoples of the Caribbean than with Latin Americans and historically most of the Creoles in Belize lived near the coast. The Creole culture of Belize is not related in any way to the Creoles of French descent. On the contrary, they have always been associated with the original British colonists. In this regard, the Creoles speak English along with a local dialect which is difficult for outsiders to understand.

The settlement in Sittee River is oriented along the river and the local roads that lead to the Southern Highway, which is the only major road in southern Belize. Rabinowitz (1986) found it to be "a quiet little town" and it remains as such. In addition to private homes, the village has two small general stores, a police station, two churches, a community center and a public school operated by the Methodist Church. Education is free for all children from the village through the equivalent of the sixth grade in the United States. Beyond this level, families must pay for children to receive higher education in schools in Dangriga, which is the administrative and commercial center of the Stann Creek district. The village is governed locally by an elected village council consisting of a chairperson and six committee members. The village council has

oversight of local public properties and functions and administers a village fund of government money for local projects and general upkeep.

Sittee River is a rural village that until fairly recently was isolated due to the distance from Dangriga and to the poor quality of the Southern Highway. In the mid-1990s the level of development increased as telephone and electrical lines reached the village and by 2002 the Southern Highway was paved which greatly facilitated transportation to the local commercial centers. Development has also increased dramatically in the near-by village of Hopkins, on the coast, where a number of hotels have been built since about 2000. These hotels provide employment for local people and have stimulated the local economy. All of these developments are causing social changes along the river, perhaps most obviously in terms of land tenure. Foreigners are acquiring land with increasing frequency and their presence may lead to further social changes as will be discussed later in the book.

The Biological Station

The Possum Point Biological Station consists of: 1) a 9-ha site, called Possum Point, located on the south side of the river about 3 km downstream from Sittee River village and about 8 km upstream from the coast; 2) a small mangrove island, called Wee Wee Caye on the barrier reef about 15 km offshore from the river mouth; and in the past 3) a 2 ha campground, called Bocatura Bank, about 1 km downstream from Possum Point on the river. Bocatura Bank has been sold but several travel-study groups made use of this facility during the early 1990s. Most of the work described here has utilized the Possum Point site on the river and this site is referred to as the biological station in this book. Facilities at both Possum Point and Wee Wee Caye include dormitories, cabins, nature trails, a dining hall, and a dock. Wee Wee Caye also has a wet lab for marine work. Facilities at Bocatura bank include tent platforms, a dining hall and two cabins. Travel between the sites and Sittee River village is by boat, and the station operates eight open, 23- to 25-ft (m) fiberglass boats with outboard motors. The biological station originated in 1986 as a winter-time component of the Northeast Marine Environmental Institution, Cape Cod, Massachusetts. The Cape Cod site closed in 1990 and Possum Point now operates year-round.

Visitors to Possum Point typically fly into Belize City by commercial airline, then fly by local air service to Dangriga, where they take a charter bus to Sittee River. Visitor groups usually stay one to two weeks, spending part of the time at Possum Point or Bocatura Bank on the river and part at Wee Wee Caye on the reef. From Possum Point one tour to the Cockscomb Basin Wildlife Sanctuary/Jaguar Preserve in the nearby Maya Mountains examines rain forest communities and freshwater streams that make up the headwaters of local rivers. On the way to the Jaguar Preserve, one can tour a local historical site of Serpon sugar mill from the late 1800s. River and estuarine communities including mangrove lagoons and floodplain forests are also visited by boat from Possum Point or Bocatura Bank. At Wee Wee Caye interest focuses on the coral reef, and visits are made to spur and groove formations, the reef crest, back reef flats, sea grass meadows, patch reefs, a small "blue hole", a rookery island, and other environments, depending on the interest of the group.

The station selects groups of 10-20 people with a certain educational basis. Groups of high schools, universities, and naturalist societies are the most common visitors to the station. A description of a typical tour involving the Possum Point Biological Station is given by Fisher and McLaren (1989).