WATER FROM STONE

ARCHAEOLOGY AND CONSERVATION AT FLORIDA'S SPRINGS

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area in excess of 10,000 years ago. By 4,000 years ago Silver Glen Springs was a virtual metropolis, bustling with people. Some made their lives here, visiting the springs frequently. Others came from afar, making the pilgrimage across swamp and sandhill, river and ridge. At that time, Silver Glen was a regional aggregation site that hosted large social gatherings, much as it does today. These people came from an area spanning hundreds of kilometers and brought with them distinctive goods used in mortuary rites, ritualized feasting, and mound building (Gilmore 2016).

But this is a hidden history, a history of events erased or forgotten with the passage of time and only now being resuscitated. To wit, a Forest Service sign marking a 5,000-year-old burial mound remarks, simply, that digging or removal of artifacts is prohibited. Although the site has been well known to artifact collectors, few people, local or tourist, appreciate the scale and significance of Silver Glen Springs in Florida's history.

The Plight of Florida's Springs

Of the many iconic places on the Florida landscape, springs are perhaps the most beguiling. In 1938 Marjorie Kinnan Rawlings published *The Yearling*, in which she wrote of Jody's spring, a small collection of "sand boils" a few hundred feet from the main pool of Silver Glen:

> A spring as clear as well water bubbled up from nowhere in the sand. It was as though the banks cupped green leafy hands to hold it. There was a whirlpool where the water rose from the earth. Grains of sand boiled in it. Beyond the bank, the parent spring bubbled up at a higher level, cut itself a channel through white limestone and began to run rapidly down-hill to make a creek. The creek joined Lake George, Lake George was a part of the St. John's River, the great river flowed northward and into the sea. It excited Jody to watch the beginning of the ocean. There were other beginnings, true, but this one was his own. He liked to think that no one came here but himself and the wild animals and the thirsty birds (Rawlings 1938:4).

She was not the first to be so enamored of Florida's springs. In 1776 William Bartram remarked on springs "emerging from the blue ether of another world" (1996:150). The poet Sydney Lanier, on visiting Silver Springs a century later (Figure 1.2), wrote: "the whole spring, in a great blaze of

Figure 1.2. Silver Springs ca. 1876, as it would have appeared to Sydney Lanier and others visiting in the late nineteenth century. Courtesy of the State Archives of Florida.

sunlight, shone like an enormous fluid jewel that without decreasing forever lapsed away upward in successive exhalations of dissolving sheens and glittering colors" (Lanier 1876:38).

Florida is home to over 1,000 artesian springs, the largest concentration of such features in the world (Figure 1.3). The best known, like Silver and Silver Glen, are enormous pools that dive into caverns of seemingly limitless depth, drawing throngs of visitors. Others are little more than gurgling puddles, nestled inconspicuously under verdant canopies of sweetgum, magnolia, and tupelo. The water they bring forth from deep in the earth—cool, clear, dancing in the dappled sunlight—stands in sharp contrast to the tannic rivers, lakes, swamps, and wetlands prevalent in Florida. Springs are places of light and life. These "watering holes for the spirit" (Burt 2003:E5) are laced with a mystique that elicits awe and wonder. Pioneering environmentalist Marjory Stoneman Douglas (1967:24) referred to springs as "bowls of liquid light," while Archie Carr (1996:63) considered them to be "the singular blessing of the Florida landscape." For many, springs are reflective of something authentically Floridian that, unlike beaches and amusement parks, is largely untrammeled by droves of interlopers from the north. In short, springs are significant places in the culture, identity, and heritage of Floridians.

Florida's springs have great economic value as well. Annually more than two million people visit the Florida State Parks that feature springs,

generating several million dollars in revenue for the state (Florida Department of Environmental Protection [FDEP] 2014). In addition to the revenue generated by park admission fees, springs provide jobs and financial stimulus to surrounding areas. Estimates of the economic benefit to the communities around just four springs—Homosassa, Ichetucknee, Volusia Blue, and Wakulla—range from $10 million to $23 million each (Bonn and Bell 2003), and Silver Springs alone contributes in excess of $60 million annually to the local economy (Bonn 2004).

Ecologically, springs are seen as unique habitats in need of protection from the impacts of development and overuse (Florida Springs Initiative 2007; Pittman 2012a). Springs are distinctive hydrological systems, with exceptional water clarity and near-constant temperature and chemistry. Many are critical habitats for endemic and endangered species of flora and fauna (Shelton 2005; Walsh 2001). Springs were central to the development of systems ecology, through the work of Howard Odum beginning in the 1950s (Knight 2015; Odum 1957a, 1957b). As steady-state systems, springs continue to be "important sites for studying ecosystem energetics and trophic dynamics" (Liebowitz et al. 2014:2010).

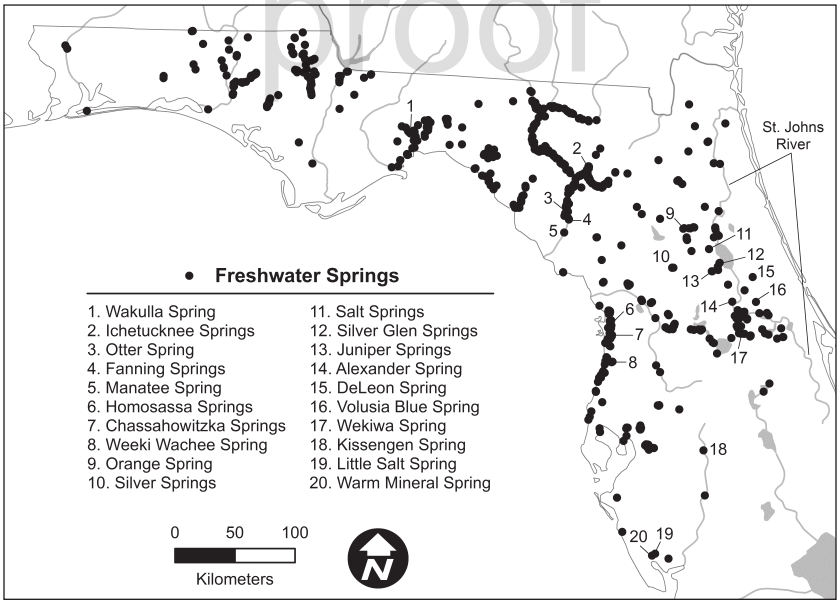

Figure 1.3. Distribution of freshwater springs in Florida, highlighting locations discussed in the text. Springs data from the Florida Department of Environmental Protection (2012).

The economic, cultural, and scientific value of springs hinges on their physical properties—water clarity, temperature, and purity—and the health of spring ecosystems. But Florida's springs are imperiled. Reports of dense algal mats covering spring bottoms and floating on the surface began in the mid-1980s and have become increasingly common (Florida Springs Task Force 2000; Stevenson et al. 2007). These algal mats choke out springs' flora and fauna and detract from their aesthetic appeal. Reporting on the state of Wakulla Springs in northwest Florida (Figure 1.4), Doug Struck lamented: "the algae is a black fuzz that coats the bottom and sucks up all the light. The luxurious waving eelgrass is pretty patchy, the schools of fish are mostly missing. The Wakulla Springs of my childhood swimming hole, the Wakulla Springs of jeweled luminescence, now exists only in memories" (quoted in Shockman 2015).

Algal proliferation is largely attributed to increases in nitrate concentration in spring waters. Nitrate, a form of nitrogen, is the most commonly elevated pollutant in the Floridan Aquifer and is primarily introduced from fertilizers used in agricultural and residential applications (Brown et al. 2008; Jones et al. 1996; Katz 2004; Knight 2015; Phelps 2004). In 1950 nitrate concentration in Florida springs generally ranged from 0.05–0.1 mg/L. By 2004 the average nitrate concentration in Florida springs had increased by an order of magnitude, and values as high as 7.5 mg/L were recorded (Heffernan et al. 2010; Strong 2004). The Florida DEP considers many large springs to be legally impaired because of elevated nitrate (Knight 2015:77). Whether elevated nitrate is the sole and direct cause of algal proliferation is debated, but nitrate has other detrimental impacts, including adverse health effects for humans and springs fauna and eutrophication of downstream aquatic environments (Heffernan et al. 2010; Knight 2015).

In addition to water-quality impairment, many springs have witnessed reduced flow since the mid-twentieth century (Weber et al. 2006; Williams 2006). Groundwater extracted from the Florida Aquifer supplies potable water to most of Florida's residents and is the primary source of freshwater for agricultural irrigation, mining, and other commercial uses (Marella 2014). Knight (2015:57) calculated the average reduction of spring flow in each of four state water management districts (WMDs) from 1930 to 2009. These range from a 16 percent average reduction in the Northwest Florida WMD to 48 percent in the Suwannee River WMD. Declining spring flow adversely impacts wildlife habitat and reduces food

Figure 1.4. Aerial view overlooking Wakulla Springs in 1967. Photograph by Richard Parks, courtesy of the State Archives of Florida.

availability as spring flow is correlated with primary production (Knight 2015:319–333). A portion of spring-flow reduction may be caused by climatic fluctuations (i.e., long-term changes in precipitation [Munch et al. 2006]), but groundwater pumping is the prime factor.

The plight of Florida's springs has not gone unnoticed. Advocacy and outreach groups have grown in prominence over the past decade, as has the voice of concerned citizens and the attention paid by media outlets (e.g., *Gainesville Sun and Ocala Star-Banner* 2013; Pittman 2012a; Knight 2008, 2012, 2015; Moran 2013; *Tampa Bay Times* 2012; Tolbert 2010).The threats facing springs, coupled with their cultural, economic, and ecological importance, led the state legislature to allocate over $24 million to springs protection from 2001 to 2011 through the auspices of the Florida Springs Initiative. Although this program was terminated in 2011, more recent financial allocations have been made to springs restoration projects by the Florida DEP and state WMDs (FDEP 2015, 2016).

However, this concern with the uncertain future of springs, of the unknown changes that will come, belies a view of springs as primordial.

Take, for example, the Springs Eternal Project (springseternalproject.org), a collaborative effort to promote springs conservation that has featured art exhibitions in museums and on public transportation vehicles. Projects such as these are commendable and have been quite successful in educating the public and motivating conservation by foregrounding the aesthetic appeal and fragility of springs. However, in so doing, a narrative is unintentionally constructed that paints springs as unchanging—relics of an ancient, pristine Florida landscape that have endured for millennia, only to buckle under the onslaught of modernity. This has the unfortunate side effect of downplaying the significance of springs in the lives of pre-Columbian Floridians, beyond claims that springs were sacred, for example, as "the home or shrine of their 'water gods'" (Knight 2015:211).

Springs, perhaps more than any other target of conservation, embody a contradiction. Many have been heavily modified, in both ancient and modern times, by humans. This includes the apparent terraforming and landscape modification of mound building, channel widening, dredging, and the installation of recreational infrastructure, and the more pernicious alterations of water quality and flow through chemical pollution and groundwater pumping. Is there a more "cultural" place? But what people value, what they seek to conserve, are not the cultural features, but the natural—the cool, clear water, the fragile ecosystems. Conservation efforts focus on the modern alteration of these places, often eliding the thousands of years of transformation that preceded it. They seek to restore springs to a pristine condition.

Anthropologists and others have long recognized that the notion of a pristine American landscape prior to European intervention is a myth (e.g., Delcourt and Delcourt 2004; Denevan 1992; Mann 2006). Anthropologists further recognize that "nature" and "natural places" (as opposed to "culture" or "cultural places") are concepts peculiar to Western thought that artificially separate the civilized human realm from the realm of the exterior, the wild, the other (e.g., Dwyer 1996; Olwig 1993). However, these insights have not penetrated conservation policy. Indeed, the notion of pristine nature is codified in federal law. The Wilderness Act[1] defines "wilderness" as "an area where the earth and its community of life are untrammeled by man" and as "land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions." But there

are few, if any, places in North America that have not been impacted by humans, and anthropogenic climate change affects the entire globe. Nor can we simply strip away the cultural veneer—the buildings, pollutants, and scoured landscapes—to arrive at something natural or pristine.

Springs have a deep history of entanglement with humanity that has been overlooked in these treatments. If we are to anticipate the future of Florida's springs, and intervene to alter it, then it behooves us to explore that history. This book is a study of Florida springs archaeology. With over 1,000 springs in the state, obviously I cannot address them all. Rather, I focus on the springs of the St. Johns River valley. I do so for two reasons: first, because these are the springs I know best and of which I have first-hand experience and, second, because in this region springs have been explicitly used to explain past cultural practices. But by focusing on these springs I hope not only to add to our understanding of specific locales, but also to unearth patterns and processes relevant to springs elsewhere.

Springs and the Archaeology of Florida

In contrast to the eternal sameness of springs, the narrative of pre-Columbian Florida and the St. Johns River valley has largely been one of gradual change (e.g., Milanich 1994; Miller 1998). In brief, it is generally thought that as the environment of Florida shifted from cold, arid conditions of the last glaciation to an amenable "near-modern" state, the people of Florida took advantage of newly available resources, populations grew, and culture slowly became more complex. Eventually, these ancient Floridians shed the simple, nomadic life of hunting and gathering to settle down in villages with hierarchy, domestication, religion, monumental architecture, and other trappings of civilization. Archaeological interpretations thus tend to emphasize the environment, ecology, subsistence, population growth, and adaptation as driving factors during early antiquity. Considerations of politics, power, symbolic life, and the like are reserved for the complex societies of more recent times.

In keeping with this perspective, springs feature prominently in reconstructions of the Paleoindian (ca. 13,500–11,500 cal BP) and Archaic (ca. 11,500–3500 cal BP) periods but fall by the wayside when the emphasis shifts to social, cultural, or ideological explanations for the later Woodland (3500–1200 cal BP) and Mississippian periods (1200–500 cal BP). Further,