Review of Cultural Resource Investigations Related to Licensing of the Levy Nuclear Power Plant, Levy and Citrus Counties, Florida

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Introduction

This report is intended to review the potential impact of the construction of the proposed Levy Nuclear Plant (LNP) electrical generation facility in Levy County, Florida, on the region's cultural resources, including prehistoric and historic archaeological sites, standing structures, cemeteries, and bridges (Figure 1). Focus is on the suitability and adequacy of the professional cultural resource assessments, particularly as regards the potential impacts of the day-to-day running of the plant on potentially undiscovered cultural resources. Construction of the LNP will have irreversible consequences for the local environment, and if there are cultural resources destroyed by either the building of or maintenance of the plant, this will result in a heritage that should be shared by all being lost by all.

Legislative Background

The legal impetus for cultural resource investigations when a federal permit is involved include: Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966, as amended through 2000 [16 U.S.C. § 470 et seq.; P.L. 89–665; 80 Stat. 915]; the Archaeological Resources Protection Act (ARPA) of 1979 [16 U.S.C. § 470aa et seq.; P.L. 96–95; 93 Stat. 721]; the National Environmental Policy Act (NEPA) of 1969 [42 U.S.C. §§ 4321–4347; P.L. 91–190; 83 Stat. 852]; the American Indian Religious Freedom Act (AIRFA) of 1978 [42 U.S.C. § 1996; P.L. 95–341; 92 Stat. 469]; and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 [25 U.S.C. § 3001 et seq.; P.L. 101–601; 104 Stat. 3048], as well as Chapter 267, Florida Statutes. These laws, regulations, and statutes are designed to help protect and preserve the rapidly disappearing cultural heritage of these United States. Without such protection, many, many historically significant cultural features would be lost to posterity, with no record of their existence or passing. In particular, Native American sites would likely suffer a disparate level of destruction, including burial sites.

Past Lessons of Florida Wetland Archaeology

Unfortunately, even with the best efforts of discovery and protection, there is always a potential for the unanticipated discovery of extraordinary archaeological sites, particularly in areas with extensive wetlands. Florida possesses what may be the greatest density of underwater and organically preserved sites in the world (Purdy 1991), but archaeologists have not developed adequate means to discover those sites before they are exposed by land altering activities. Two well-publicized examples from Florida clearly illustrate the bounty and risks of its enormous tracts of inundated land. These examples also illustrate the occasional shortcomings of site discovery methodology. The use of shovel-test pits at regular intervals is highly effective in areas where standing water or shallow water tables are not an issue, but in areas where water and wetlands are present, this method fails terribly. Compounding the issue, there are not commonly employed alternatives in areas of inundation or shallow water tables, leaving those areas that are often most likely to have well preserved sites totally uninvestigated.

A world famous example of a spectacular accidental discovery in Florida wetlands is the Windover site near Titusville. During the construction of a housing development in 1982, the simple dewatering of a small, undistinguished pond turned up a number of human bones. After a standard investigation by local law enforcement, archaeologists were called in and began excavation of the site. Years later, the Windover site is one of the only sites in world to produce intact brain matter and abundant organic materials, including fabric, cordage, and wood in a context greater than 7,000 years old. Windover is but one of many aquatic cemeteries in Florida, and if anything has been learned over the years, native Floridians commonly practiced aqueous burial, and any small wetland is potentially a graveyard.

More recently, during some of the most intense drought conditions on record, dozens of dugout canoes begin to be exposed in Newnan Lake, near Gainesville, a similar karst area where significant groundwater withdrawals occur. A large scale salvage program was initiated, resulting in the recording and dating of over 50 canoes, most dating to ca. 5,000 years ago. Many, many more were not saved, due to time, damage, and financial considerations. Again, a small Florida wetland produced one of the most spectacular archaeological finds in North America.

Compliance Related Cultural Resource Investigations at the Levy Nuclear Plant Site

In association with the Combined License Application to the Nuclear Regulatory Commission by Progress Energy Florida, Inc. (PEF), cultural resource investigations were undertaken in two phases, both through contract with CH2M Hill. In 2007, Sara Orton conducted a survey for historically significant standing structures older than 50 years in an area within a 1 mile radius of the projected center of the LNP site and along a .25 mile corridor along the projected transmission corridor (Figure 2). This survey did not locate any structures greater than 50 years old (Orton 2008). There are however several previously recorded historic standing structures nearby, most importantly in the nearby community of Yankeetown, southwest of the LPN project area. Two structures, 8Lv707 and 8Lv708, are considered eligible for inclusion in the National Register of Historic Places (NRHP).

The second phase of cultural resource survey was conducted by personnel from New South Associates, subcontracted by CH2M Hill (Koski et al 2008). This survey was intended to locate any buried or exposed archaeological sites in the area to be potentially impacted by the LNP project and assess the potential of those sites for inclusion in the NRHP. There were actually three separate surveys conducted, one of a circular area directly atop the plant construction area, measuring ca. 300 acres, and combining surface inspection, systematic shovel-testing, and judgmental shovel-testing, an area of ca. 2500 acres inspected by systematic shovel testing, and an area of ca. 3300 acres, inspected by judgmental shovel testing and surface inspection.

Shovel tests are small holes, ca. 18 inches across or less, usually extending to a depth of ca. 3 feet, unless water is encountered. Soils from these tests are screened to recover artifacts. Shovel testing is the primary method of site discovery in much of the eastern United States. There were a total of 72 shovel tests excavated in the 300 acre circular parcel (Figure 3), or an average of one shovel test every 4.2 acres. Survey was also conducted in the area called the Lybass Property and Blowdown Pipeline, an area of approximately 2,500 acres, shown as a "dogleg" extending to the Marjorie Harris Carr Cross Florida Greenway south of the project area (Figure 3). A total of 331 shovel tests was systematically excavated within this area, or an average of one shovel test every 7.6 acres. The final area surveyed is the northern portion of the LNP site boundaries, measuring ca. 3,300 acres and encompassing the 300 acre circular area mentioned above (Figure 3). There is some ambiguity in the report if the total number of shovel tests reported for this area includes those excavated within the 300 acre circular area. Presuming that the total of 150 shovel tests does not include those within the circular parcel, and excluding that same parcel from the acreage total, there was an average of one shovel test every 20 acres.

Three newly discovered archaeological sites and six archaeological occurrences (areas of low artifact density) are recorded by Koski et al. (2008). Two of the archaeological sites (8Lv744 and 8Lv745) are prehistoric sites, while the third archaeological site (8Lv746) is a historic rail spur. All of the archaeological occurrences represent isolated finds of prehistoric artifacts. Koski and associates do not consider any of the sites potentially eligible for NRHP inclusion.

Archaeological Concerns at the Levy Nuclear Plant

The cultural resource assessments conducted by Orton (2008) and Koski et al. (2008) have met the current legal obligations of PEF, as conceived of by the State of Florida, meaning, the state's Historic Preservation Office has accepted these two surveys as sufficient, with the caveat that there remains to be surveys of projected transmission lines (Gaske 2008). However, as a professional archaeologist, I have particular concerns that there are certain elements that have not yet been considered, but that have potential to cause irreparable damage to undiscovered cultural resources. This region of Florida is hardly a barren archaeological region. Hundreds of sites are found on the coast, along with hundred more inland. Of special note is the nearby Crystal River site complex. A complex of several mounds, this site was one of the most important ceremonial centers of the Gulf Coast, with artifacts demonstrating a wide ranging network of material and information exchange and an incredible number of burials (Milanich 1994). It is reasonable to expect that there remain many more as yet undiscovered significant sites in the immediate neighborhood.

Extensive wetlands are cited by Koski et al. as reason for the small amount of shovel testing within the 3,300 acre LPN site parcel. As stated above, there was an extremely low rate of testing in this parcel, an average of one shovel test per 20 acres. Of course, most the shovel tests were focused in areas suitable for shovel testing. Koski et al. estimate that they actually tested ca. 700 acres of the 3,300 total (2008: 41), leaving as much as 2,600 acres completely untested. A large part of this untested area is inundated land, i.e., that land most likely to have buried archaeological sites with well-preserved materials.

Compounding this lack of coverage, the only archaeological investigation in the southern LPN site block (Figure 3) is along the Lybass Property and Blowdown Pipeline corridor. It is unclear when this parcel was added to the site plan, but it is found on maps from August 2010. Therefore, it appears likely that this parcel was added after the cultural resource investigations outlined above. Accounting for the corridor, there remains more than 1,900 acres of unsurveyed land in the southern site block. Between the two blocks, as much as 4,500 acres have not been surveyed for cultural resources in any fashion whatsoever. The rates of shovel testing in areas tested is worrisome as well, with an average of a single shovel test per 4 acres being the highest intensity strategy employed.

An argument could be made that the boundaries of these site blocks only represent the property to be controlled by the LPN, not areas that are scheduled to be altered. That may be the case, that no construction will take place beyond the areas already surveyed, but once the areas have been considered "cleared", there will be no further investigation if PEF, or anyone, decides to conduct land altering activity within those bounds.

More certain is the impact that drawdown (removal of water from the aquifer) will have on the local water table. A series of model maps (Figure 4) shows that there will be a consistent and repeated depression of the local water table, by as much as 5 feet (PEF 2010: Fig. 5-1). For all of the sites with preserved organics in local mucks and peats, this repeated drying of the local water table will be ruinous.

A final concern is the viewshed impact of the reactors and cooling towers. If the height of 225 for each reactor unit reported in the DEIS, page 3-3 is correct, then these structures will dominate the skyline for many miles surrounding the proposed LNP site. According to the August 2010 Draft NUREG, the SHPO agreed with PEF to only consider a 1 mile APE for viewshed, but with the low overall topographic relief of the local environment, and the fact that at 225 feet, these structures will stand far above any trees, it seems likely that the two NRHP eligible structures in Yankeetown will have their viewshed adversely impacted, as will possibly the Crystal River archaeological complex and several additional structures in the immediate vicinity that are recorded in the state's standing structure inventory, but where the NRHP status has yet to be evaluated.

Conclusion

As indicated above, although legal requirements may appear to have been met by the cultural resources investigations the methods used for the site surveys were not conducive for identifying cultural resources where they are most likely to occur - in the wetlands. Therefore, the status of permits should be re-evaluated as they relate to cultural resources. It would be prudent to survey all the acreage within the LNP properties, in addition to all of the surrounding areas that would be affected by any alterations of the water levels. Most importantly, methodology needs to be devised to investigate the wetlands and other inundated areas, even if it is only exploratory at this time. Finally, the visual impact of the structures to be built should be reconsidered, with a much more intensive modeling of sightlines and viewsheds.

References Cited

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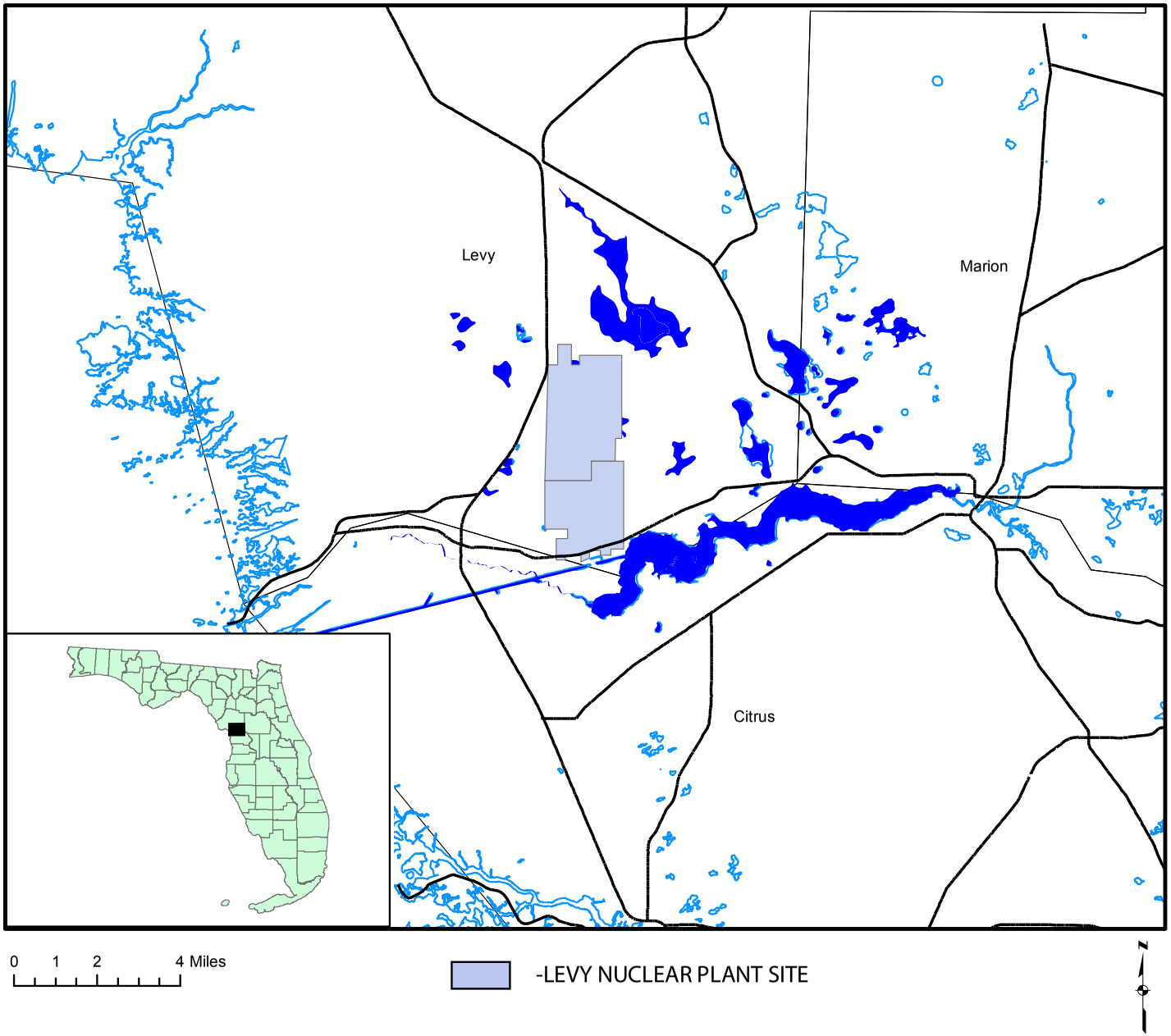

Figure 1: Location of Levy Nuclear Power Plant Site

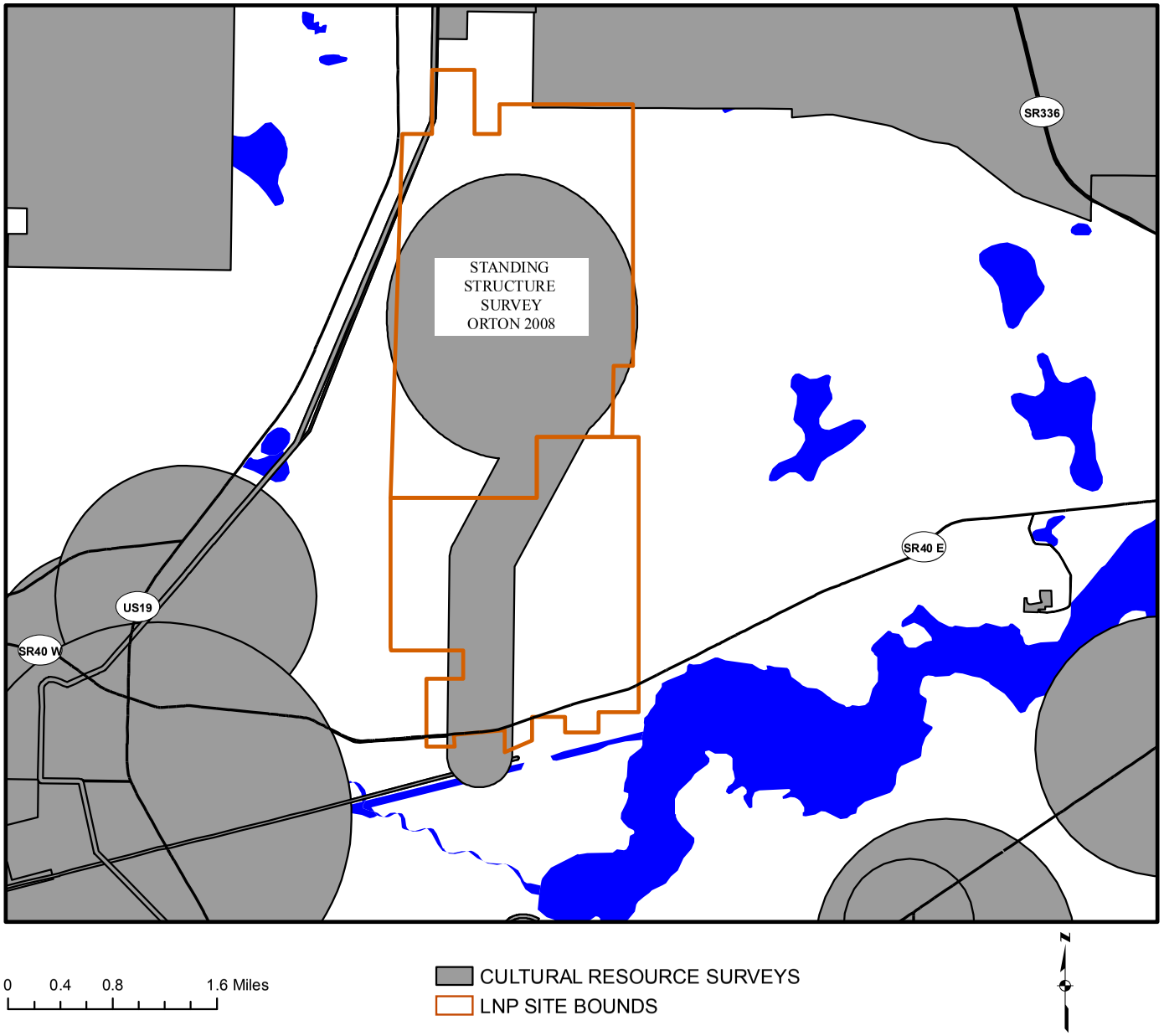

Figure 2: Orton Standing Structure Survey

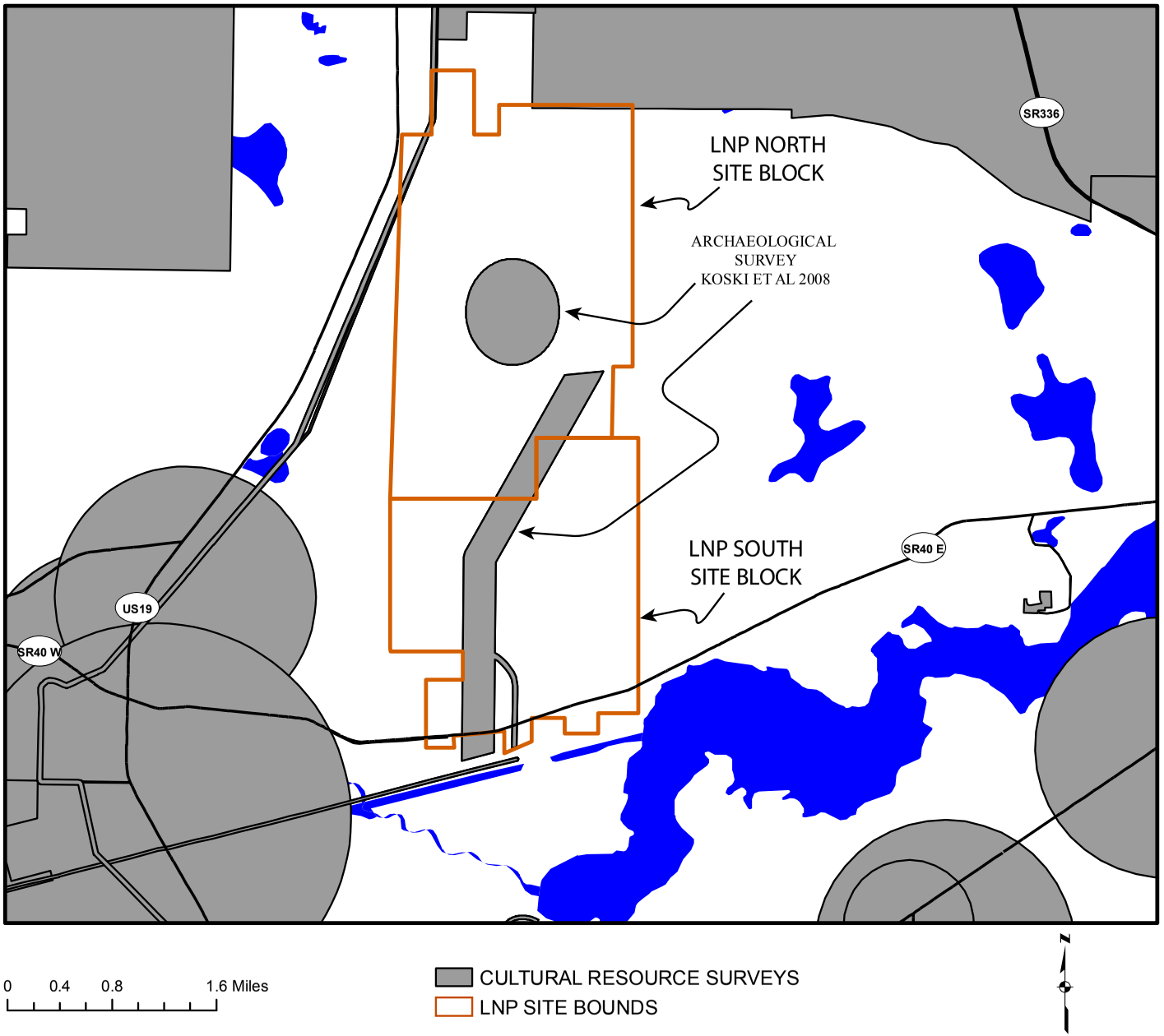

Figure 3: Koski et al Archaeological Survey

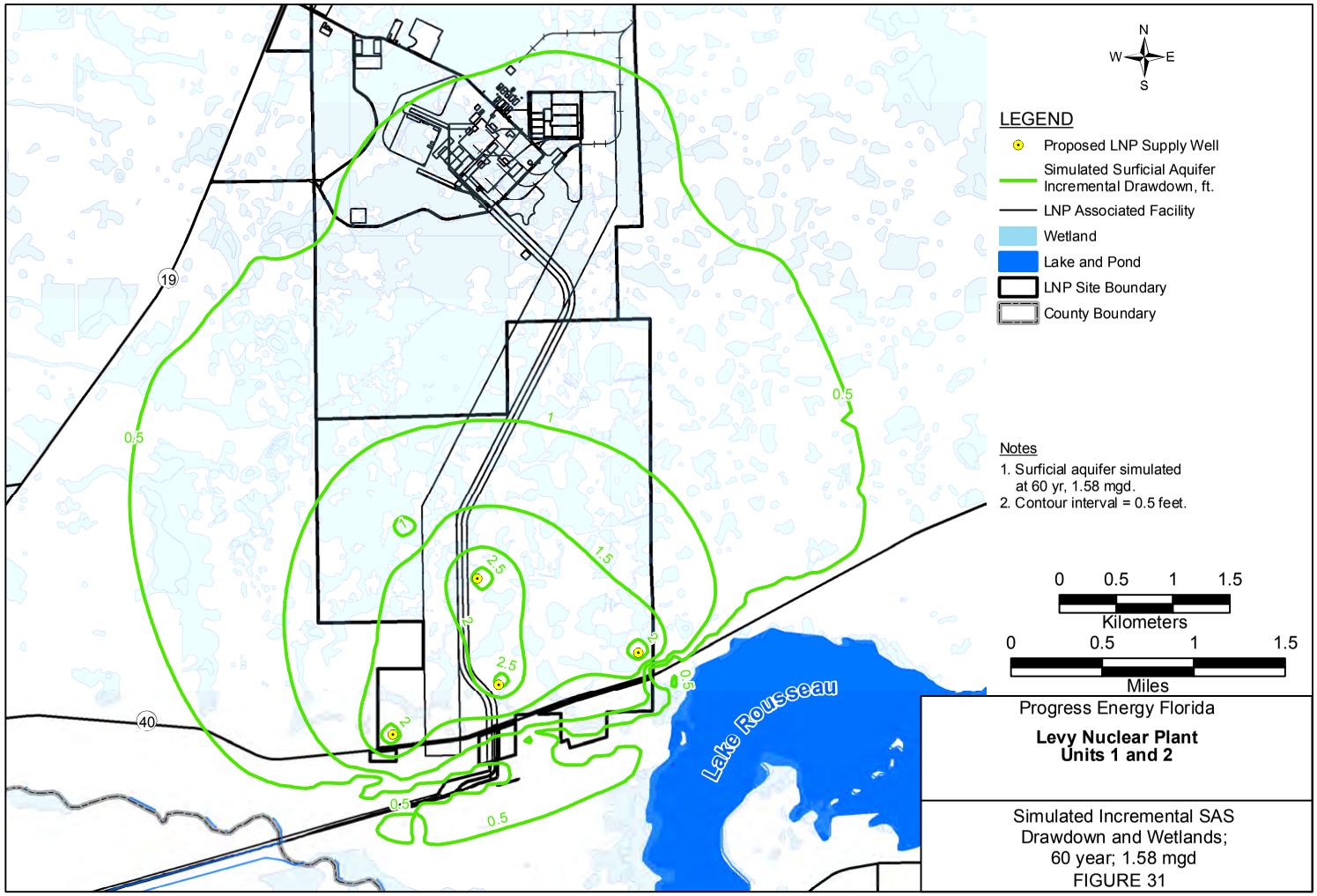

Figure 4: Simulated Drawdown Impact (PEF 2010)