LEE COUNTY RESOLUTION NO. 07-01-32

A RESOLUTION OF THE LEE COUNTY BOARD OF COUNTY COMMISSIONERS **CONFIRMING** CERTAIN AMENDMENTS TO THE CONSERVATION 20/20 LAND ACQUISITION PROGRAM PARAMETERS AND **SELECTION CRITERIA** AS **DEVELOPED** BY ACOUISITION CONSERVATION LANDS AND STEWARDSHIP ADVISORY COMMITTEE PURSUANT TO THE PROVISIONS OF LEE COUNTY ORDINANCE NO. 05-17; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Board of County Commissioners ("the Board") is the governing body in and for Lee County, a political subdivision and charter county of the State of Florida; and,

WHEREAS, the Board has previously adopted Lee County Ordinance No. 05-17, relating to the acquisition of environmentally sensitive or critical lands in Lee County; and,

WHEREAS, pursuant to Lee County Ordinance No. 05-17, the Conservation Lands Acquisition and Stewardship Advisory Committee ("CLASAC"), is charged with the duty to establish the parameters for the Conservation 20/20 Program ("Program") to include the criteria for land purchases, procedures to implement the Program and processes for ranking purchases; and,

WHEREAS, previously, the CLASAC developed the Program parameters as required by Lee County Ordinance No. 05-17, Section Three, paragraph B., and the Board adopted same pursuant to Lee County Resolution No. 97-06-82 and No. 01-01-35; and,

WHEREAS, the Board now desires to confirm certain amendments to the Program parameters as further developed by the CLASAC.

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1-23-07

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF LEE COUNTY COMMISSIONERS that:

- 1. The amendments to the Program parameters as developed by the CLASAC and as set out as a composite "Exhibit A" hereto, are hereby accepted, confirmed and authorized for implementation by the CLASAC.
 - 2. This Resolution shall take effect immediately upon its adoption.

Commissioner Hall , made a motion to adopt the foregoing

Resolution, seconded by Commissioner Mann . The vote was as follows:

BOB JANES

A. BRIAN BIGELOW

RAY JUDAH

TAMMY HALL

FRANK MANN

Aye

DULY PASSED AND ADOPTED this 23rd day of January, 2007.

ATTEST: CHARLIE GREEN CLERK OF COURTS

Elde of Coolers

Deputy Clerk

BOARD OF COUNTY COMMISSIONERS OF LEE COUNTY, FLORIDA

7

Chairman

APPROVED AS TO FORM:

 $\mathbf{R}_{\mathbf{v}}$

Office of County Attorney



CONSERVATION 20/20 PROGRAM INITIAL REVIEW CRITERIA

In general, nominations to the Conservation Lands Acquisition Program must be able to answer "yes" to a minimum of four out the following seven questions to be eligible for further consideration for potential acquisition. Applications may or may not be considered if the asking price is significantly higher than staff's estimated market range current market conditions. (See Criteria 1).

1) Does the owner indicate by his/her asking price a willingness to sell below market value range?

All applications to nominate a property to the Conservation 20/20 Program must include the asking price. County staff will conduct a market analysis of the property in order to compare the asking price with staff's estimated market range-current market conditions.

2) Are there any other funds available to contribute towards the purchase price of the parcel?

Contributory purchase funds must be currently available to acquire the nominated property. For example, a pending grant application for funding would not qualify. Contributory purchase funds are typically provided by not-for-profit groups or government agencies.

3) Does the parcel contain documented environmentally sensitive lands?

Environmentally sensitive lands may include, but are not limited to:

- a) Wetlands
- b) Rare and Unique Uplands (scrub, mature pine flatwoods, oak or cabbage palm hammock, tropical hardwood)
- c) An outstanding natural plant community
- d) Evidence of listed wildlife or plant species
- e) Undeveloped island, beach and dune system, and/or tidal creek or inlet
- f) Eco-archaeological resources
- 4) Does the parcel have water resource features that are important for surface water and ground water management?

Examples include areas that provide flood protection, that improve or maintain water quality, that conserve water resources, that improve or preserve the water supply and/or that have high recharge potential to an aquifer.

5) Is the parcel contiguous to a protected environmentally sensitive land or water body?

Protected environmentally sensitive lands and waters include existing or proposed public and private conservation lands; mitigation banks; conservation easements; wildlife management areas and refuges; and sovereignty submerged lands.

- 6) Is there good potential for long term management of the property?

 This criteria will be evaluated according to overall management potential including but not limited to access, compatibility with surrounding land uses, co-management opportunities, mitigation potential, potential for environmentally compatible recreational uses, and restoration needs.
- 7) Are the native plant communities or water resources on the property in any danger of being detrimentally altered?

Does the parcel have government approvals or zoning (such as an agricultural exemption, development order, or planned development zoning) that allows for immediate land clearing or land development that, if exercised, would diminish the natural resource benefits of the property? This criteria only applies if the natural plant communities and hydrology of the property are substantially in their natural condition.

CONSERVATION 20/20 PROGRAM	SECONDARY REVIEW

SCORE COMMENTS			9	LG.	4	8	2		0 ·		4	4	2			8	4	2	0		2		2			2	
CRITERIA	SIZE AND CONTIGUITY	1. Size of Property	a. > 500 acres		c. 300 to <400 acres	d. 200 to <300 acres	e. 100 to <200 acres	f. 50 to <100 acres	g. < 50 acres	2. Contiguous to:	a. Coastal waters/other sovereignty submerged lands	b. Existing preserve area, c.e., wma or refuge		HABITAT FOR PLANTS AND ANIMALS	1. Native Plant Cover	a. > 75 % of the property has native plant cover	b. 50% to < 75% has native plant cover	c. 25% to <50% has native plant cover	d. < 25% has native plant cover	2. Significant for wide-ranging species	Panther Habitat, wetlands, ponds, grass lands, etc.	3. Rare and Unique Uplands	a. Scrub, hammock, old growth pine	b. Mature, second growth pine flatwood	4. Diversity	a. 5 or more FLUCCS native plant community categories	a or 4 FLUCCS native plant community categories

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SIGNIFICANCE FOR WATER RESOURCES	Serves or can serve as flow-way	Site contains a primary flow-way, creek, river, wetland corridor, large contributing watershed; possibly identified in the Lee	County Surface Water Master Plan, South Lee County Study, or by staff	Site contains flow-way, through t	watersired, or just a portion of system one side of conveyance, may not be identified in study	c. Same as b., smaller watershed, not as defined, disconnected	d. Site conveys runoff, minimal area	e. Site provides no conveyance of surface water	f. Add 2 points if conveyance is natural (not man-made)	Strategic to Flood Management	Well defined flood-way within parcel, possibly identified in FEMA or other study, both sides of conveyance, large upstream area,	a. protection from encroachment critical or known flooding history	b. Same as a., portion of floodway (one side) or within floodplain	Medium size watershed, need for floodplain protection, possibly serves as an outfall for a road or development	d. Small watershed, minimal flooding	e. No significant flood issues	Protect a water supply source.	Parcel is within area designated high potential productivity of the Water Table, Sandstone or Tamiami Aquifer and also within	a. area of current or proposed wellfield development	Not within above mentioned zones, but advantageous due to	proximity to existing water supply facilities or identified as b . potential water storage area		ffse	Presence of wetland, retention, or lake that is currently providing		c. No existing or potential water quality benefits
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D. LAND MANAGEMENT/RECREATION/PLANNED LAND USE	1. Good Access for Public Use and Land Management	Parcel can be accessed from a freeway, expressway, arterial street, or major collector	Parcel can by accessed from a minor collector or local street	Parcel can be accessed from a privately-maintained road that is	Parcel can only be accessed by a private road or does not have physical or legal access	2. Recreation/Eco-Tourism Potential	Score depends upon the variety or uniqueness of potential	public uses. Examples of appropriate public uses include	paddling sports, fishing, hiking, equestrian, mountain biking,	as eco-archealogical resources.	3. Land Manageability		50%-75% of the perimeter of site is surrounded by low impact	land uses	25%-50% of the perimeter of site is surrounded by low impact	Less than 25% of the perimeter of the site is surrounded by low	impact land uses	4. Development Status (Maximum 4 points)	The Parcel is Approved for Development or is Exempt from	a. Clearing Regulations	b. The Parcel is Zoned for Intensive Use	c. Future Land Use Map: Intensive Land Use Category	TOTAL POINTS	STAFF RECOMMENDATION	CRSC RECOMMENDATION	CLASAC RECOMMENDATION

ADD TO DEFINITIONS:

Eco-archaeological resources (Initial Criteria 3.f.)

A parcel containing an archaeological site has high eco-archaeological value (1) if it has yielded, or is likely to yield, scientific information on Lee County's environment; (2) if it contains special, unusual, or unique vegetative communities specific to archaeological sites; (3) if it contains high potential to educate the public about Lee County's environment; (4) if it has potential to contribute to land and wildlife conservation goals.

If by "resources" we mean things that address specific needs, then:

- 1) Eco-archaeological resources include, but are not limited to, the seeds, wood, shells, otoliths, bones, and sediments in archaeological sites that, when excavated systematically and interpreted scientifically, can help us understand Lee County's past environments (climates, sea levels, ecosystems) and how they have varied at multiple time scales. Due to the influence of the calcium carbonate in mollusk shells, which mitigates the corrosive effects of acids in the soil, such resources are preserved in abundance in the coastal shell middens of Lee County. Thus, all sites with high shell content, a characteristic often visible at the ground surface, are likely to yield scientific information about Lee County's past environments. Furthermore, all sites located at or below the high-tide line, and all sites that contain deposits that are near or below the water table, have additional potential for extraordinary preservation of organic remains (wood, fibers, seeds, and other plant parts, as well as bones and other animal remains). These extraordinary deposits, sometimes called "wet sites," can yield very detailed information on the plant and animal communities of the past, and hence, on the past environment in general.
- 2) Eco-archaeological resources include living plants and plant communities that thrive on archaeological sites due either to specific nutrients and chemicals associated with archaeological soils or to the purposeful or non-purposeful manipulation of the landscape by past people. In Lee County, these unusual plant communities prominently include upland forests located on coastal shell mounds. However, inland sites, such as sand mounds, and those in riverine contexts can be of equal importance if they contain human-influenced ("anthropic") soils and are associated with unusual plant communities. We need to preserve them for future study because they cannot be duplicated by planting new trees. They are heirloom plants that are present in part because of decisions made by people in the past, and in part due to environmental changes that have occurred since then. Further, they are particular associations of heirloom plants. They are the descendants of ancient trees and other plants that have grown in association with one another for centuries, and hence they hold information that can help plant taxonomists and climate scholars understand how plants in certain associations (and the animals that depend on them) respond to environmental changes.

Exhibit "B"

- 3) Eco-archaeological resources include all archaeological sites that lend themselves to public interpretation and education about Lee County's past environments. Such a site would have to be accessible to the public, able to be managed and kept safe for visitors, and have enough known about it through research to be able to offer an authoritative and interesting environmental story. Such sites encourage a better understanding about how the environment works and how best to conserve its resources. It is hard to appreciate something that you do not understand. We have learned that the public is fascinated with learning about Native American people, and that information about the environment in which these people lived can be taught easily and effectively in the context of learning about the people themselves. Not every archaeological site will lend itself to public education, no more than every Conservation 2020 acquisition will make a good park. But when an archaeological site has an important environmental and historical story to tell (Mound Key and Pineland are outstanding examples, but there are many more), it has high value.
- 4) Eco-archaeological resources include all archaeological sites that have the potential to contribute to land and wildlife conservation efforts. In combination with or as components of county public lands, state aquatic-preserve lands, and federal wildlife refuges, eco-archaeological lands potentially can contribute to landscape linkages/corridors which potentially will accommodate shifting plant and animal communities in response to rising water levels over the next 100 years. For example, the sediment bases of many of Lee County's mangrove-forested wetlands today are actually archaeological middens. This kind of substrate makes these forests more resistant to erosion due to sea-level rise and increasing storm intensity. As sea-level rise accelerates, middens that are today above mean sea level can serve as bases for future wetland forests.

- Lee County's Coastal Eco-Archaeological Lands support modern, unique, living biological communities. The majority of Lee County's coastal eco-archaeological lands contain enormous numbers of preserved molluscan shells and fish bones. These high concentrations of calcium carbonate have resulted in a native-plant community type that includes high numbers of calcifers—hardwood trees and other plants—that take in calcium carbonate. (Walter Kingsley Taylor, author of Florida Wildflowers in Their Natural Communities, includes this special community as one of his coastal-uplands subtypes.) And because these lands often occur in mound form (sometimes multi-mound forms), the communities are elevated (e.g., Mound Key, Pineland, Josslyn Island), adding to their definition within the surrounding low-lying wetlands. These elevated, hardwood lands are important coastal-upland refuges for mammalian, avian, and reptilian populations.
- Lee County's Coastal Eco-Archaeological Lands contribute to the development of modern and future landscape linkages/wildlife corridors. Well-known proponent of wildlife corridors, University of Florida's Professor Emeritus Larry Harris modeled Florida's future under a 2-degree C (average annual temperature) warming scenario (with Cropper in 1992 Global Warming and Biological Diversity). Relevant to Lee County is the associated sea-level rise which will result in the loss of existing coastal wetlands, through erosion and inundation. In an alarming, March 2006 issue of Science, scientists (Overpeck et al.) state that if greenhouse gas emissions continue at their present rate, "many meters [4 to >6] of sea-level rise" could occur "before the end of this century;" the possibility far exceeds previous estimates. In combination with or as components of county public lands, state aquatic-preserve lands, and federal wildlife refuges, eco-archaeological lands can contribute to landscape linkages/corridors which potentially will accommodate shifting plant and animal communities in response to rising water levels over the next 100 years.
- Lee County's Coastal Eco-Archaeological Lands contribute to modern and future wetlands conservation in a world challenged by rising sea levels. While many people think of eco-archaeological sites as mounds, they also exist in the form of broadly distributed middens, usually blanketing shorelines. Because "shorelines" shifted back and forth in response to fluctuating sea levels in the past, middens today occur at varying elevations, sometimes below mean sea level, sometimes within the tidal zone, and sometimes well above the high tide mark. The sediment bases of many of Lee County's mangrove-forested wetlands today are actually archaeological middens; this kind of "substrate" makes these forests more resistant to erosion. Lee County recently (2001) acquired a perfect example at Pineland. As sea-level rise accelerates, middens that are today above mean sea level can serve as bases for future wetland forests.

- Lee County's Coastal Eco-Archaeological Lands are archives of plant and animal histories. Papaya (Carica papaya) seeds discovered in 1992 at Pineland in a second-century-A.D. context sparked a debate in the botanical world. Some Florida scholars were unwilling to accept the find because it went against the conventional knowledge--that papaya had been introduced to Florida in the nineteenth century and not before. Dr. Lee Newsom, a McArthur Fellow at Penn State University studied the seeds and convinced the doubters. So, is papaya, then, a native plant of Florida? Is it a coincidence that the second century A.D. was a period of climatic warmth? Should our definition of "native" be more flexible to accommodate more Caribbean species given the world's warming climate? The discoveries of bones from extinct Caribbean monk seals (Monachus tropicalis) in the Pineland and Wightman zooarchaeological collections required a visit to the Smithsonian Institution for their identification, one of the few places in the world that houses a complete Caribbean monkseal skeleton (Friends of Randell Research Center Newsletter, March 2005). Archaeological records of monk seal are rare and extremely important for understanding their natural history due to the seal's extinction in the 1950s (Adam 2003 in Marine Mammal Science) and two of Lee County's eco-archaeological lands have produced seal records. These two examples—papaya and monk seal—demonstrate the potential of eco-archaeological lands to produce new knowledge about Florida's native biota.
- Lee County's Coastal Eco-Archaeological Lands play an important role in the science of climate change. The National Research Council (Abrupt Climate Change 2002) has made a call for more paleoclimate and human-climate research that focuses on the past 2,000 years. The idea is that more records from multiple sources (proxies) and places around the globe from this time period will lead to a better understanding of our current state of global warming by putting it in "recent" historical context. The Florida Museum of Natural History and its Randell Research Center (RRC) accepted this challenge, recognizing that Lee County's eco-archaeological lands contain records of the highest potential for humanclimate research. In part due to the high molluscan diversity (mollusks are especially sensitive to environmental change) of local estuarine-marine waters, a diversity that is also represented in its archaeological lands, this research potential is unparalleled in the state of Florida. Beginning in 1985, the National Science Foundation (NSF), the National Endowment of Humanities, the State of Florida, regional and local foundations, etc., and many private individuals have supported this research in Lee County via the Florida Museum/RRC. Currently, NSF's Earth Systems History program supports a collaborative study between the Florida Museum/RRC (Dr. Karen Walker) and the University of North Carolina (Dr. Donna Surge, geochemist).
- Lee County's Coastal Eco-Archaeological Lands serve as "monitoring stations" of past estuarine conditions. Zooarchaeological remains, primarily fish bones and mollusk shells, record past estuarine conditions. One can calculate diversity indices, for example, for different time periods. These can be used as paleosalinity indicators, as can oyster-bar assemblages that are represented in the middens. Fluctuating paleosalinity can indicate droughts, flooding, and possibly varying sea levels through time. Buck Key, Useppa, Pineland, Mound Key, Josslyn Island, and Wightman have all contributed to such studies (Walker et al. 1995 in *Journal of Coastal Research*). Archaeological clam (e.g., quahog, surf) shells and fish (e.g., sea catfish, sea trout) otoliths exhibit growth bands which, when sampled, produce isotopic records of ancient water temperatures and salinities. They may

even record hurricanes; this is because rainwater of the eyewall is depleted of the isotope Oxygen 18 (the rainwater is taken up by the living clam). Working with the Florida Museum/RRC, UNC's D. Surge is examining this possibility using a quahog clam (Mercenaria campechiensis) that survived 2004's Hurricane Charley as a case study (Friends of the Randell Research Center Newsletter, September 2005).

- Lee County's Coastal Eco-Archaeological Lands record past warm/sea-level rise episodes. Two past multi-century warm-climate episodes have been proposed for southwest Florida based on evidence from Lee County's eco-archaeological lands. The episodes also coincide with warm episodes known for Europe: the latter part of the Roman Optimum (A.D. 1-500) and the Warm Medieval Period (A.D. 900-1300). (These were not warmer than today, however.) It is becoming increasingly clear to climate scientists that the atmospheric/oceanic systems of the Atlantic Ocean, Caribbean Sea, and the Gulf of Mexico are all inter-related (Broecker 2003 in Science), and therefore such correlations should not be surprising. Some of the Lee County evidence is in the form of zooarchaeological remains indicating higher aquatic biodiversity and higher salinities compared to previous and subsequent centuries. At Pineland, during the 4th century, a major hurricane surge (the context of the seal bones, mentioned above) inundated the native shoreline village and a mangrove-forested wetland subsequently formed. It is during this time that residents may have retreated to the small mound in the eastern woods at Pineland (20/20 Nomination 045-2). Temperature and salinity analyses of Pineland quahog clam shells and sea catfish (Arius felis) otoliths from the first of the two episodes are underway (Walker and Surge).
- Lee County's Coastal Eco-Archaeological Lands record past barrier-island histories. The two warm periods cited above coincide in time with some of the beach-ridge deposits on Sanibel and Cayo Costa islands and also in NW Florida (Stapor et al. 1991 in *Journal of Coastal Research*). They also coincide with the absence of deposits which can indicate erosional events. For example, the southern half of Cayo Costa has come and gone repeatedly over the past 2,000 years and the same is true for some of the region's inlets. Eco-archaeological lands preserve clues to these histories. For example, on Useppa Island, oyster-shell middens representing multiple centuries of human occupation abruptly give way to middens with a much greater diversity and concentration of high-salinity mollusk shells in the 9th/10th centuries. This change suggests the sudden presence of at least an inlet nearby (closer than those of present day) to provide direct access to the littoral zone. The middens correspond to a warm, sea-level rise episode when the barrier islands would have undergone erosion. Thus, it is plausible that the entire southern half of Cayo Costa may not have existed during this time.

- Lee County's Coastal Eco-Archaeological Lands record hurricanes of the past. The modern hurricane record is so short that climatologists today debate whether or not global warming is a factor in increasing storm frequency and intensity. Longer records (projected back in time) are needed for context to better understand the role of global warming. Leading hurricane specialist Dr. Kerry Emanuel at MIT (published in *Nature*), contacted Florida Museum/RRC's Walker about Lee County's paleostorms which we have identified at Pineland and Wightman and have dated to the 4th century A.D. Emanuel has recently coined the term "paleotempestology" for this new area of research.
- Lee County's Coastal Eco-Archaeological Lands record abrupt climatic-change episodes. Can a major, volcanic eruption in a faraway tropical region, against a background of an already cooling climate, have an impact on southwest Florida? After a warm period, Scandinavian glaciers began to expand by A.D. 500, and 36 years later a massive eruption occurred and its volcanic aerosols indeed had global impact, enhancing the cooling by blocking radiation (Keyes, 2001 Catastrophe). Lee County's coastal eco-archaeological lands record impacts of this rapid sixth-century cooling and subsequent prolonged related conditions. Most intensively studied at Pineland, the evidence includes: an impoverished finfish fishery; ecological disruptions in estuarine molluscan predator/prey relationships; extraordinary population increases in an opportunistic, wide-ranging scavenger, the common crown conch (Melongena corona) and in migratory ducks; a lowering of water levels; and a replacement of pine over mangrove as fuelwood. By A.D. 700, Pineland appears to have been abandoned. During these same centuries, across the Gulf of Mexico, the Mayans suffered a series of droughts (Hodell et al. 2000 in Science) and eventually their civilization collapsed, circa A.D. 800 (Gill, 2000 The Great Mayan Droughts). Temperature and salinity analyses of Pineland's quahog shells and sea catfish otoliths from the 6th/7th centuries are underway (Walker and Surge).
- Lee County's Coastal Eco-Archaeological Lands may record the Little Ice Age. Although the Little Ice Age (LIA), A.D. 1300-1850, is known to have been a broad-scale cooling event, paleoclimatologists need to know if it was a global event. Almost no one has looked for its evidence in south Florida. Recently, Woods Hole Oceanographic Institute researchers (Lund and Curry 2004) analyzed sediment cores from off the Florida Keys and results indicate cool sea surface temperatures for this time. Florida Museum scientists are currently analyzing isotopes of archaeological quahog clam shells and sea catfish otoliths from Pineland (Walker and Surge) and surf clam (Spisula solidissima) shells and sea catfish otoliths from Mound Key (Marquardt, Quitmyer, Jones, Stoetzel) to determine if they also record the cooler LIA temperatures. Buck Key also was inhabited during the LIA and it represents another opportunity to detect related environmental changes.

Karen J. Walker, Ph.D., Environmental Archaeologist
Florida Museum of Natural History/Randell Research Center
21 years of professional experience with Lee County's Coastal Eco-Archaeological Lands
(Feel free to e-mail if I can be of assistance or if full reference citations are needed.)

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