

Intensive Land Use and Conservation Planning at the University of Central Florida

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ABSTRACT: Conservation strategies are necessary for cities to meet regional goals of sustainability, but commitments and collaborative efforts among influential stakeholders for economic and developmental growth frequently hinder conservation efforts. This study analyzes how planning documents influence conservation at the University of Central Florida (UCF). I use an inductive method of analysis to explore the stated conservation goals and commitments of UCF’s Campus Master Plan. I then compare these objectives with the behaviors of the institution. This research indicates that the absence of collaborative efforts among agencies has resulted in UCF undermining its academic mission. Intensive land-use has sparked global environmental concerns to protect and restore lands of environmental significance, and institutions of higher education are considered essential in achieving such goals of sustainability. I provide two theories of social environmental change as well as two major components influencing the progress of conservation at UCF. Limited financial investments and excessive threats of amendments undermine conservation efforts at UCF. The Campus Master Plan lacks harmony between the Capital Improvements, Future Land-Use, and Conservation Elements. In UCF’s Campus Master Plan, development encroaches upon environmentally significant lands. My research describes why issues of land management exist and how cooperative efforts among stakeholders can improve conservation at UCF while enhancing its academic and economic missions.

KEYWORDS: planning, conservation, development, imperiled species, University of Central Florida

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INTRODUCTION

The University of Central Florida (UCF) is a large, public research university that opened with a student body population of 1,948 students in 1968. As of this writing 59,785 students attend UCF (Institutional Knowledge Management). In the last five decades UCF has changed its land use significantly. From 1,227 acres in 1968, UCF has expanded to encompass a current total of 1,415 acres. Students, faculty, staff, and visitors of the university enjoy numerous on-campus amenities, including convenient transportation, state-of-the-art buildings, manicured landscapes, natural lands, as well as an abundance of surrounding community support facilities, such as restaurants, hotels, and care centers, to meet the needs of people traveling to and from UCF. The university attracts people from around the globe to pursue their educations and careers by offering a diverse environment with opportunities in many different fields. UCF has developed its lands to keep pace with its growth as necessary to fulfill its mission of providing students with an outstanding academic environment.

In the last fifty years, UCF has developed its built infrastructure to accommodate a growing number of students, curriculum, and research interests. This growth, however, has required land-use changes that contribute to biodiversity loss (Rosenberg et al., 1997). UCF is surrounded by diverse habitats, including pine flat woods, sand pine scrub, cypress domes, and wetlands. It is unique compared to other state universities based on the richness of plant and animal diversity found within its natural lands. UCF's role in regional and metropolitan economic growth has been, and continues to be, a significant focus for policy makers and urban planners. However, this policy focus has negatively impacted environmental priorities, making it difficult to reduce or repair habitat loss, habitat fragmentation, and species isolation.

UCF provides habitat for some of Florida's most endangered and threatened species. Sandhill cranes are commonly seen on campus. Much of their native habitat has been rapidly developed by humans (Living with Sandhill Cranes). Gopher tortoises burrow deep under the sandy soil, which provides a stable micro-climate for other species exploring the shrubby lands of the arboretum. Wood storks and sand skinks shy away from urban areas and associated activity, but can be found seeking refuge in the UCF Natural Lands. According to Becker (2011), habitat loss is a primary factor

contributing to species loss in Florida and has become a global issue.

This research investigates the institutional commitment and challenges to conservation vital to the future of these species. In my research, I use UCF's Final Campus Master Plan (UCFCMP) to measure and describe priorities through administrative semantic behavior and compare this behavior against the stated conservation goals of the University. This paper proceeds as follows. First, I explain the stated conservation goals as published by UCF's administration in relation to two important theories of the social causes of environmental change. Second, I explain the method and approach of this study, which employs a grounded content analysis of the UCFCMP as a representative document for the on-the-ground development plans of UCF. Finally, the findings of this study are discussed, and recommendations for the future explored. The goals, policies, and objectives of other elements of the UCFCMP that conflict with the Conservation Element are included in the findings.

STATED CONSERVATION GOALS AND THEORIES OF SOCIAL ENVIRONMENTAL CHANGE

Goal 1 of 2.13 Conservation Element of UCF's Final Campus Master Plan pledges to "Maintain a commitment to the protection of the University's ecosystems and lands" and to "ensure that these resources are protected for the benefit of present and future generations while accommodating the continued development and expansion of the campus's built environment" (UCFCMP). However, how committed is the University to protecting lands of environmental significance? The University's declaration of its commitment toward development in this Conservation Element contradicts the definition of conservation: to protect and preserve natural lands and resources. Development is one of the most pervasive threats to conservation (Rosenberg et al., 1997). My first theory of social environmental change proposes that contradictions such as this exist in political documents due to institutional values that endorse industrial progress for economic growth. Industrial growth is "accommodated" despite environmental concerns of habitat loss. Due to a lack of commitment of politicians and developers, habitat loss remains unaddressed. The UCF planning documents indicate that the administration understands the significance of protecting and maintaining natural lands. However, efforts to combat habitat loss and developmental trends in Florida do not promote conservation.

The 1994 CMP recognized the importance and pursuit of conservation strategies at UCF. Goal 1 of 2.13 Conservation Element reveals a theme of institutionalized compromise between conservation and development. It hopes to protect undisturbed lands while at the same time “accommodating the continued development and expansion of the campus’s built environment” (UCFCMP). This leads to my second theory of social environmental change: themes of compromise exist in political documents because stakeholders, such as developers, conservationists, and UCF administration, are capable of ensuring collaborative measures in achieving diverse goals. However, the complexity of environmental, political, and economic concerns can contribute to the failure of stakeholders to ensure effective collaboration among scientists, decision makers, and other stakeholders (Reyers et al., 2010). Collaboration among agencies is critical to conservation success and is impacted primarily by the presence, or absence, of communication, adequate funding, and strong scientific research. The central difference of institutionalized values and developmental trends involves the differential power of structure (theory 1) and agents (theory 2).

METHODOLOGY

Grounded Theory entails collecting qualitative data, conceptual analyses of that data, and the development of theory based on what is found “grounded” in the data (Charmaz, 2006). Evidentiary materials should maintain relevance to the research. Data can include photos, interviews, letters, and published research, as well as political documents and newspaper articles because they add understanding and originality to the research. Distinguishing and defining a research situation and collecting data relevant to that research are critical steps in understanding the complexity of the study. After rigorous review of the data the researcher is aware and knowledgeable of what is actually happening within the dimensions of the study.

Rather than conducting a regular deductive content analysis, I chose to use grounded theory to analyze qualitative data and develop a theory based on what is considered “grounded” in the data. Using this method of inductive theory, I am capable of going beyond my first impressions of the study, which is a tremendous benefit of using grounded theory. Textual analysis in grounded theory allows the researcher to grasp the reality of the situation, promotes further exploration of questions that might arise, and keeps the researcher engaged in pursuing

emergent theory (Charmaz, 2006). As opposed to testing a hypothesis in traditional deductive content analysis, the data, rather than the literature, is given priority. Using grounded theory for my undergraduate research has increased my understanding of the obstacles presented in the fields of environmental policy and conservation.

This research began with an initial concern for conservation of *Gopherus polyphemus*, the gopher tortoise, and land-use at UCF. I collected information on gopher tortoises as well as information on UCF’s history. This search led to my discovery of the UCF Final Campus Master Plan 2010 (UCFCMP). I decided the UCFCMP would be my primary source of data because it characterizes the integrated aspects of University actions, policies, and values. My protocols for document inclusion were determined by the relevance of the documents to conservation, academic research, and development at UCF. Extra data sets provide additional insight to the research and yield rigorous comparative analysis between the stated goals of conservation at UCF and the actual actions of the University. In this way it is possible to identify and present the obstacles to conservation as well as solutions toward adopting environmental procedures to preserve and protect land at UCF. Important sources of data collected for comparative analysis include:

- UCF’s Comprehensive Master Plan from 1995
- Master Plan for New State University in East Central Florida 1965
- 2.13 Conservation Element 2005-2015
- Documents pertaining to *Gopherus polyphemus* obtained from Dr. Peter Pritchard at the Chelonian Research Institute
- Arboretum documents from the UCF Archives Office
- Campus Land Management Plan for UCF (1987-1992)
- Other documents concerning biotic communities at UCF, also obtained from the UCF Archives Office.

After the processes of data collection, I thoroughly reviewed each element of the UCFCMP. A word-by-word analysis, a technique of grounded theory, was used to “stimulate more abstract thinking by focusing intensely on specific words in the data” (Oktay, 2012). By focusing on specific words the researcher can understand what is implied in the data, and thus additional insight is added to the collection of qualitative analyses. Applying this technique encourages further questions and exploration

of the research situation. I used this technique as a coding mechanism to derive categories from the data and identify themes within each document. Next, I used axial coding, which is a technique for exploring the categories and concepts developed in the word-by-word analysis to distinguish how categories relate to each other (Otkay, 2012). Data elements are then compared to each other to identify a theory based on facts presented in the data. After reading the CMP, I decided that only four elements were of high relevance to the research. I selected these elements based on their relevance to my primary concern for conservation and land use. Elements include:

- 2.13 Conservation (2010-2020)
- 2.14 Capital Improvements (2010-2020)
- 2.2 Academic Program (2010-2020)
- 2.4 Future Land Use (2010-2020)

Categories represent themes or variables that can be found within the data. According to grounded theory a theoretical hypothesis can then be defined using coding to contrast data between each document. The data is considered to be saturated when new information does not add new themes or insight to the categories. In the coding process, letters represent the different categories. My coding scheme is as follows:

- A = State Interest
- B = Consistent with other elements
- C = Amendable
- D = Local Interest
- E = Funding Required
- F = National Interest
- G = Opportunity Areas

There are numerous stipulations for data to be accepted into the coding scheme. These coding requirements maintain organization and consistency within the research. Coding rules are as follows:

1.State Interest

- Any department pertaining to the State (Florida Fish and Wildlife Conservation Commission, St.John’s River Water Management District)
- Any funding allotted by the state (Public Education Capital Outlay, or PECO)
- Any State statutes
- Any State officials
- Any mention of endangered or threatened species

2.Consistent with other Elements

- Anywhere in an element that refers to another element(s)
- Anywhere in an element that mentions having been superseded by another element

3.Amendable

- Anywhere in an element that mentions it is amendable to the policies or objectives presented in the Campus Master Plan

4.Local Interest

- Any department local to Central Florida involved in the CMP (Landscape and Natural Resources, Facilities Planning and Construction)
- Surrounding Communities
- Development Plan Approvals
- Any mention of endangered or threatened species

5.Funding Required

- Mentioning of projects funded by the State (PECO)
- Projects set forth by the departments of UCF (LNR, Facilities Planning and Construction)

6.National Interest

- Federal Agencies
- Federal Laws
- Any mention of endangered or threatened Species

7.Opportunity Areas

- Proposed ideas for Conservation and Research
- Areas of CMP that are vague or inconsistent

The values representative of the University’s conservation and land use priorities can be derived by coding the elements of the UCFCMP. A method of choosing and counting specific research-related words within the set of documents can derive a representative set of values associated with the University. To see how consistent the UCFCMP is, root words were selected that are critical to the progress of conservation initiatives at UCF, including the following:

- Amend
- Fund
- Land
- Park

Root words catch related words, so that “fund” catches “funding” and “funder.” “Land” was only counted when referring to the actual land itself, such as “land” or “landscape,” and not counted when used in the context of a department name or title such as Landscape and Natural Resources or Future Land Use Plan. The goal is to understand how important the ecological aspects of the landscape are to UCF. I can determine this by counting how many times the word “land” is used in an element. The word “fund” was counted to determine if certain elements received more financial attention than others. The word “amend” was counted to determine if certain areas of the CMP are more amendable than others. Lastly, “park” was counted, used in the context of parking. Heavy traffic is prevalent at UCF and increased demands for parking structures threaten its remaining natural lands. The primary purpose for counting “park” is to determine the interests of UCF concerning this issue.

FINDINGS

Two major factors impacting conservation at UCF were found in the documents. First and foremost, an unequal distribution of planning for funds between conservation and development exists at UCF. The word “fund” is mentioned 21 times in 2.14 Capital Improvements Element as compared to only once in 2.13 Conservation Element (refer to Fig.1). The data clearly reveal an imbalance of financial interests against conservation interests. Secondly, most initiatives aimed toward conservation at UCF are amendable. 2.4 Future Land Use Element, which directs developmental patterns at UCF and includes both 2.13 Conservation Element and 2.14 Capital Improvements Element (coded as B, consistent with other elements), mentions the word “amend” nine times (refer to Fig. 2). Eight of the nine times concern the term conservation. The data demonstrate the importance of land to UCF, limited funds for conservation, and repeated threats of amendments by the University.

Public Education Capital Outlay (PECO) funds are provided to UCF by the State of Florida. Therefore in accordance with the coding scheme, any information related to PECO funds are coded as “A, State interest.” These funds are granted to the University for the purpose of providing infrastructure to accommodate educational

programs, student population, administration, and accessory services of the campus (Statutes and Constitution). For the 2011-12 school years, \$66,560,308 was granted to UCF in the form of PECO funds. PECO funds are essential in providing students with the support structures necessary for achieving academic goals; however, these funds are also fundamental for maintaining an expanding industrial economy with a primary focus on construction and development. The 2.14 Capital Improvements Element describes the administrative processes for coordinating construction projects and annual reviews of infrastructural needs. Goal 1 of 2.14 Capital Improvements Element outlines its aim to “Provide facilities to meet the academic needs of student enrollment as projected in the Academic Program Element and space needs assessments.” This goal is coded as B, consistent with other elements. According to the Academic Program Element, UCF’s projected fall headcount for students for the 2011-12 school year was 42,495 (UCFCMP). The actual fall headcount for 2011-12 was 59,785 (Institutional Knowledge Management).

This influx of nearly 20,000 additional students in the University is a primary reason for the rapid development of infrastructure at UCF. An accurate prediction of growth dynamics has not been fully factored into campus planning. UCF creates pressures for funding infrastructural growth by accepting more students than what current capacity standards can maintain. Parking is a primary example of the significant infrastructural growth at UCF. It shares an equal word count with conservation in 2.4 Future Land Use Element (refer to Figure 2). Parking will continue to be an issue of conflict concerning land use due to the increasing number of students accepted to UCF, combined with the difficulties of providing students with efficient transportation alternatives.

The only time the word “fund” is mentioned in 2.13 Conservation Element is in Policy 1.2.12, which states, “Fencing to prevent tortoises from entering nearby roadways will be established, contingent upon availability of funds” (UCFCMP). Gopher tortoises are considered a threatened species in Florida: “Under the Endangered Species Act (ESA), species may be listed as either endangered or threatened. ‘Endangered’ means a species is in danger of extinction throughout all or a significant portion of its range. ‘Threatened’ means a species is likely to become endangered within the foreseeable future” (US ESA). The ESA is a national law to protect and recover imperiled species such as the gopher tortoise, as well as

the ecosystems upon which they depend. Therefore, any mention of threatened or endangered species in the UCFCMP is coded as “F, National Interest” and “A, State Interest.”

The development of UCF’s campus has been successful due to the financial contributions of the State; however, it is not required that any percentage of these funds be put toward conservation. Thus development at UCF has come at the cost of habitat loss and fragmentation that has led to the isolation of small populations. The Florida Scrub-Jay (*Aphelocoma coerulescens*) is an endemic species of Florida that previously resided at UCF (in its earlier years as Florida Technological University [Appendix UCF Archive]). However, due to extreme modification and destruction of habitat, this bird can no longer be found in UCF’s Natural Lands. According to Rosenberg et al (1997), “Ultimately, the processes of isolation and population extinction lead to a reduction in biological diversity” (677). The abundance of funds used for infrastructural growth at UCF, compared to the lack of funds placed toward conservation initiatives (i.e., providing fencing for preventing tortoises from entering nearby roadways), indicates minimal effort by the University to prevent further imperilment of vulnerable species. Consistent with my first theory of social environmental change, contradictions such as this exist in planning documents due to institutional values of industrial progress for economic growth.

The Conservation Element of UCF’s Campus Master Plan receives limited financial attention and is further weakened by potential amendments. Despite the amendments mentioned in 2.4 Future Land Use Element toward conservation, the most important goals and objectives within 2.13 Conservation Element are amendable. This does not mean that all amendments are negative. However, the pressures and trends of infrastructural growth at UCF threaten the viability of conservation strategies at UCF. Aerial images collected from the UCF Archives illustrate the rapid increase in development patterns implemented by UCF over the last several decades (refer to Images 1-4).

The 2.13 Conservation Element discusses the protection of environmentally sensitive lands at UCF. Policy 1.1.1 of this element states:

The University shall maintain in a natural state all of those sites identified as conservation on the Future Conservation Areas Map. New

areas shall be considered for potential designation as Conservation Areas based on documented conservation values, e.g., presence of imperiled or vulnerable species or natural communities or other features of state, regional, or local concern, due to declines or vulnerability to further losses. Consistent with the Future Land Use Element, except for minimal structures and improvements necessary to ensure safe access and essential support functions, there shall be no construction in these areas except pursuant to an amendment to this Plan adopted in accordance with all applicable state and local requirements. (UCFCMP)

This policy reflects a theme of indefinite conservation at UCF. Conservation receives no net gain unless UCF protects current conservation lands and seeks to acquire other property that can be included in the acreage in the category of protected land. It is not clearly stated that natural areas will be permanently protected from development. However, it is explained that construction is possible in conservation areas with the appropriate amendments that meet applicable requirements.

UCF has conveyed in its Final Campus Master Plan that the protection of imperiled or vulnerable species and natural communities is expendable. According to Suazo et al (2009), “Habitat loss or modification is the major threat to most of the world’s threatened and endangered species, so management to restore and improve habitat quality is of great conservation importance” (2322). The data suggest that UCF intends to accommodate the continued infrastructural growth of the University, consistent with my first stated theory of social environmental change. This is inconsistent with State and National policies or interests of protecting and restoring valuable ecological entities.

Other factors impacting research and conservation at UCF are discussed as follows. After comparing the 2005-2015 and 2010-2020 versions of 2.13 Conservation Element, I discovered two important differences in regard to Policy 1.2.12. In the 2005-2015 version of 2.13 Conservation Element Policy, 1.2.12 states the objective to:

Continually maintain the upland preserve located in the north portion of the campus as gopher tortoise relocation area for tortoises

that test positive for Upper Respiratory Tract Disease. Fencing to prevent the tortoises from easily entering McCulloch Road will be established. (UCFCMP)

Here, UCF presents its concern and awareness of urban impacts on the survival of vulnerable species, by providing a fence to prevent gopher tortoise fatalities from vehicular traffic. UCF states its commitment to provide what is necessary to prevent these incidents. The University also recognizes a fatal disease to *Gopherus polyphemus* that has been a major concern for many biologists and conservationists. Brown et al (1999) state that symptoms of the Upper Respiratory Tract Disease (URTD), mentioned in Policy 1.2.12 of 2.13 Conservation Element, include “serous, mucoid, or purulent discharge from the nares, excessive tearing to purulent ocular discharge, conjunctivitis, and edema of the eyelids and ocular glands” (2264–65). The disease is caused by a bacterial mycoplasma that is spread when tortoises come in contact with one another (Riedl, 2006). According to a non-published document obtained from Dr. Peter C. H. Pritchard at the Chelonian Research Institute, Oviedo, Florida, “in more severe cases the cornea becomes opaque, resulting in blindness, either transitory or permanent. Tortoises affected by URTD also display lassitude, weakness, anorexia and weight loss” (1989). The potential for the spread of URTD increases with relocating gopher tortoises more frequently. Policy 1.2.12 reflects UCF’s concern for gopher tortoises that test positive for URTD.

Policy 1.2.12 was updated in the 2010–2020 version of 2.13 Conservation Element. The updated policy states:

The upland preserve located in the north portion of the campus will continue to serve as the gopher tortoise relocation area for tortoises, until the carrying capacity has been reached for that parcel. Fencing to prevent the tortoises from entering nearby roadways will be established, contingent upon availability of funds. The University shall explore the future protection of upland habitat to serve as a gopher tortoise relocation and management site. (UCFCMP)

UCF modified the preceding (2005–2015) text to include all gopher tortoises, not only those tortoises testing positive for URTD. This indicates a distinct change of values and interests at the University. Tortoises

testing positive for URTD were previously relocated to conservation sites at UCF as indicated by Policy 1.2.12. The updated amendment made to Policy 1.2.12 to include all tortoises, not those specifically testing positive for URTD, is essential in understanding how conservation strategies can change as scientific knowledge becomes available.

The Florida Fish and Wildlife Conservation Commission (FFWCC) now requires that gopher tortoises be tested for URTD before being relocated due to the risk of spreading the disease (Riedl, 2006). Any tortoises that test positive for URTD cannot be relocated off-site. This is consistent with my second theory of social environmental change: compromise and collaborative efforts are essential for stakeholders to achieve goals. The URTD tests performed before tortoise relocation ultimately protect the wellbeing of tortoises elsewhere. It should be noted that UCF was previously accepting relocated tortoises testing positive for the disease. This implies that the mixing of populations has occurred; therefore, URTD in populations of gopher tortoises at UCF cannot be disregarded.

Policy 1.2.12 of 2.13 Conservation Element is coded as G, Opportunity Areas. Students pursuing the fields of veterinary medicine, botany, and biology have the opportunity to participate in monitoring the health of imperiled species at UCF. This experience is essential for student academic development. Students do not have to travel far to gain hands-on experience related to researching and understanding the dynamics of healthy ecosystems and species. Protecting UCF’s Natural Lands is critical if UCF is to achieve its academic mission of “address[ing] pressing local, state, national, and international issues in support of the global community” by enriching student development and pioneering impactful research (Mission Statement UCF).

Data retrieved from the UCF Archives indicate that UCF has undermined the scope of its academic mission in regard to environmental studies and sustainability in favor of providing infrastructural needs such as parking lots and garages. Surrounding scrub habitat in the UCF Natural Lands was leveled in 1989 to provide a parking lot near the original ROTC building (Carte, 1989). Construction began earlier than the projected date resulting in the destruction of student research taking place in the UCF Natural Lands. A similar incident occurred in 2004 when “UCF officials sent heavy equipment to the Arboretum where work crews chopped

a significant part of the Arboretum's forest into mulch and altered the drainage of its wetlands" (Spear and Balona, 2011). UCF did not have the appropriate permit from the State or the St. Johns Water Management District (SJWMD) for clearing this land. The destroyed portion of the Arboretum was a designated Conservation Easement according to the UCFCMP. The destruction of student research as well as the loss of protected conservation areas at UCF may be the result of low levels of communication among stakeholders, including UCF administration, conservationists, and developers.

The amendments made in the updated 2.13 Conservation Element demonstrate important fund limitations for conservation, as well as changing interests of the University in establishing the permanent protection of environmentally significant lands. It is evident that development can take place despite the lack of funds for providing substantial measures for protecting species affected by the encroaching urbanization. UCF presents a poor sense of conservation planning by allowing intense development near conservation areas with minimal financial investment to provide the materials necessary for implementing successful conservation and remediation strategies. Insufficient steps are being taken to prevent physical destruction of federally protected ecosystems and species.

DISCUSSION

University sustainability initiatives transform local and regional developmental patterns and encourage fundamental research in the fields of political, economic, social, and environmental sciences. Anthony Cortese (2003) discusses the procedures necessary for accelerating ideas about accepting sustainability into society. Cortese analyzes several structural aspects of the current industrial system and how they contribute to the disintegration of education. These aspects include human interactions and activities, environmental strategies, technology, and policy, while industrial activities threaten the profound responsibility of higher education institutions to provide the knowledge, skills, and values necessary in constructing a just and sustainable future (Cortese, 2003).

Cortese (2003) concludes that there must be a transformative shift in the thinking, values, and actions by all of society's leaders, professionals, and general population in addressing issues of sustainability. Cooperation is a critical tool in achieving sustainability goals, though it is believed that the stresses of higher

education on individual learning result in professionals who are ill prepared for cooperative efforts. The educational experience of college students and graduates must reflect an intricate connection among curriculum and research (Cortese, 2003). Cooperative measures are necessary to improve local and regional conditions so that communities achieve social, economic, and environmental stability.

Pearce and Uhl's (2013) research demonstrates the importance of University leaders recognizing their sustainability deficits and implementing policies designed to guide society toward a sustainable future. One example of this approach is found in the Green Destiny Council (GDC) at Pennsylvania State University. Faculty, staff, and students at the university united to form the GDC to achieve goals of sustainability. The GDC divided the University into nine systems: energy, water, materials, food, land, transport, buildings, community, and research. Sustainable practices for each system were defined. The ecological mission of the GDC was to alter Penn State University's policies to include principles of sustainability.

Pearce and Uhl (2013) focused on integrating environmental concerns in teaching, research, and service missions. First, the GDC drafted an ecological mission for Penn State. The University leaders then proceeded to review the ecological mission providing feedback on concerns related to the ecological proposals. The GDC modified the mission to address the concerns of the reviewers. The GDC's final consensus statement offers a clear vision for guiding the future of Penn State's developmental decisions and sustainability initiatives. The work of the GDC led to the formulation of ecological principles for Penn State. Clearly, whether Penn State follows through with its ecological mission over time is yet to be seen, but it provides a model for placing sustainability at the center of university planning.

The research of Cortese (2003), as well as Pearce and Uhl (2013), recognizes the advantageous position of higher education institutions as facilitators for societal and ecological progress. Pearce and Uhl (2013) found that the key to implementing sustainable practices in the long-term resides in the institution to carry out ecological initiatives (p. 60). Plan development and annual reviews for conservation at the institutional level are critical in achieving sustainability goals. A lack of commitment, cooperation, and values for conservation at the institutional level continues to hinder the progress and continuity of regional sustainability.

UCF insists on achieving ecological goals. However, their persistence in doing so has been hindered by the institutionalized values of industrial development for economic growth. What can UCF incorporate into its Campus Master Plan to ensure wise land use and concurrently protect Florida's most vulnerable species? UCF's Final Campus Master Plan shows that conservation does not take precedence over financial investments and projected planning. Developing a financial plan for conservation is the first goal in advancing conservation at UCF. Further research includes monitoring investments in improving ecological systems and their effects on global sustainability and environmental security. UCF's administration demonstrates an understanding of the ecological and legal obligations of protecting imperiled species and habitat; however, the extensive development of UCF has overshadowed many commitments made toward conservation.

APPENDIX

Figure 1: Word analysis of root words critical to the progress of conservation at UCF (land, fund).

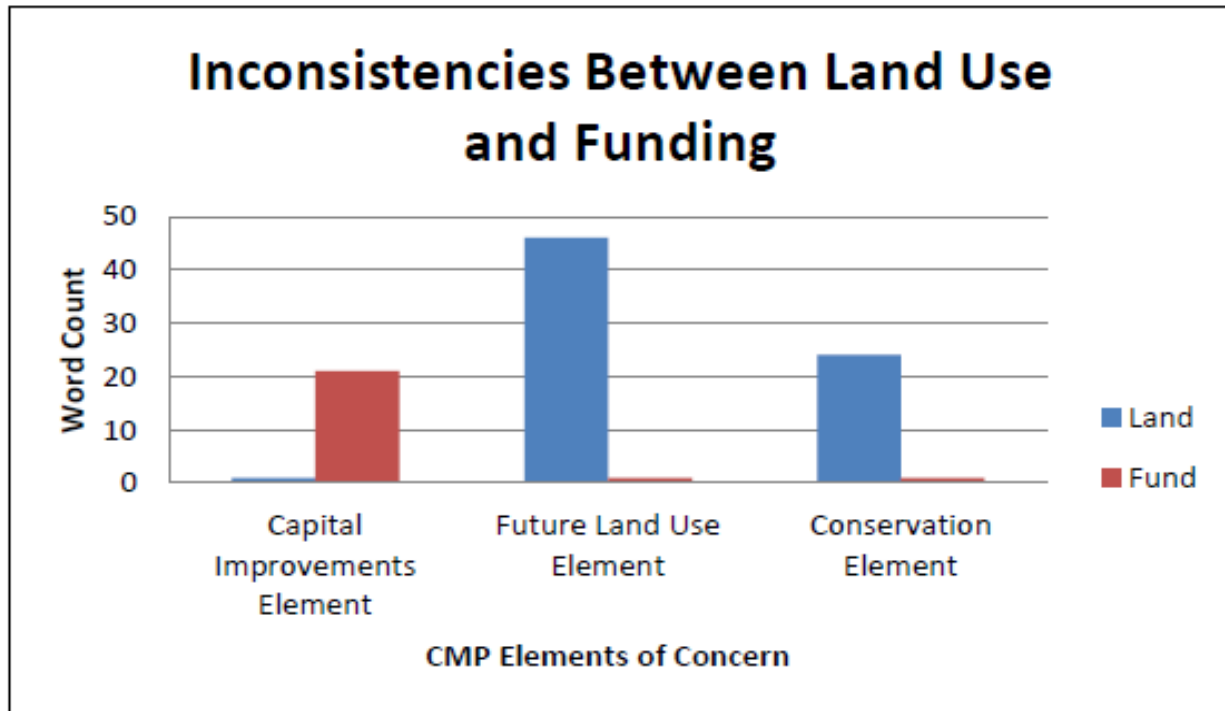


Figure 2: Word analysis of root words critical to the progress of conservation at UCF (amend, park, conserv).

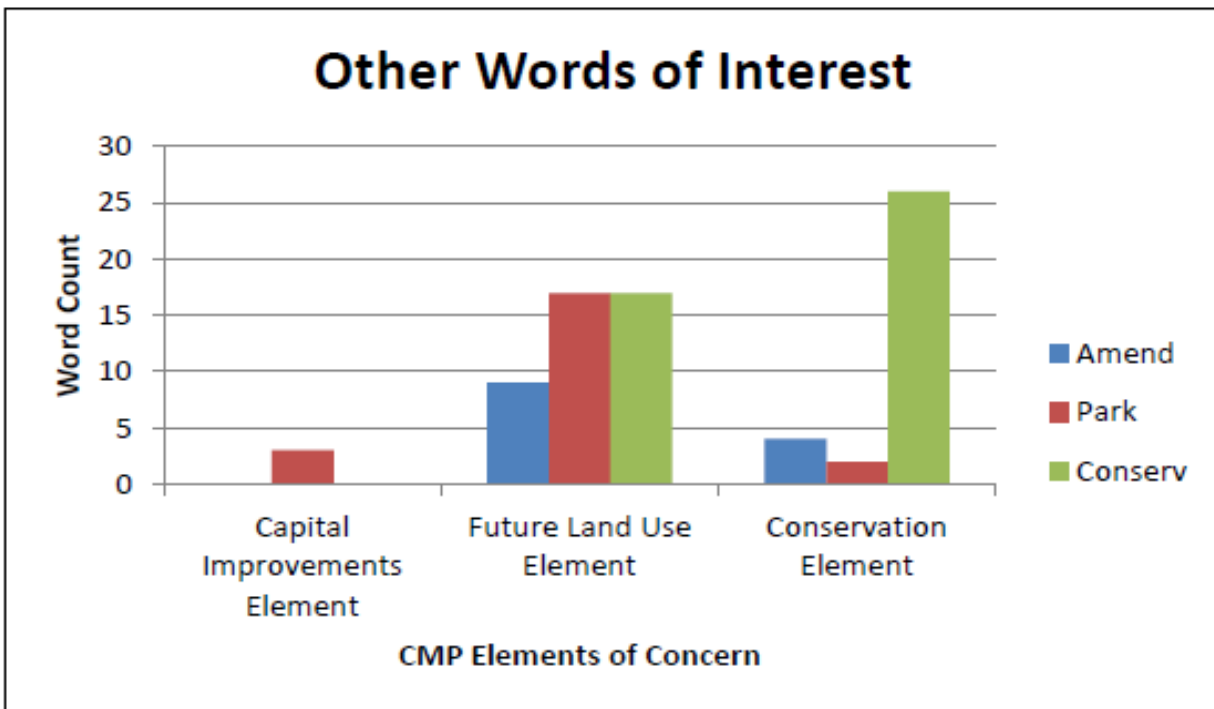


Image 1: Aerial photograph of UCF campus from 1967 (formerly FTU).



Image 2: Aerial photograph of UCF campus from 1978.



Image 3: Aerial photograph of UCF campus from 1987.



Image 4: Aerial photograph of UCF campus from 1999.



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