

Florida Museum of Natural History

FY 2007-2008 Budget Request

March 16, 2007

1. Mission and Purpose

The Florida Museum of Natural History (FLMNH) is Florida's state museum of natural history, dedicated to understanding, preserving and interpreting biological diversity and cultural heritage. The FLMNH functions in a dual capacity as the legislatively established natural history museum of Florida and official repository for biological and anthropological specimens (FS1004.56), as well as a university (UF) museum.

2. Goals and Expected Outcomes

- **Teaching:** The FLMNH does not award degrees or offer its own courses. Nevertheless museum faculty (curators) regularly teach undergraduate and graduate courses, directed studies, and supervise graduate students through our cognate academic departments across campus. This symbiotic relationship has proven successful as museum faculty have access to students and associated departments receive credit for student credit hours generated. The museum represents a vital teaching and educational resource at UF, particularly in teaching courses that cover biological, anthropological and paleontological topics. Our goal each year is to achieve or exceed the teaching levels of the previous FY.

Total FTE loaned to other academic units for FY 05/06 = 6.0 FTE

1) CLAS: Lower/Upper Division = 1.1 FTE; Graduate Level = 3.2 FTE

Total to CLAS = 4.3 FTE

2) IFAS: Lower/Upper Division = 0.5 FTE; Graduate Level = 1.2 FTE

Total to IFAS = 1.7 FTE

FLMNH faculty served on 126 UF graduate student committees, chaired the committees of 66 graduate students, and directed 86 independent studies last year.

- **Research:** The FLMNH is recognized by its peer institutions as one of the leading university natural history museums in the nation. Establishment of the Molecular Genetics Laboratory and the McGuire Center for Lepidoptera and Biodiversity has thrust the museum into an international leadership role in biodiversity research and education. They also have enabled us to grow our Center for Informal Science Education into a nationally recognized developer and exporter of model programs.

The ca. 28 million specimens and artifacts held at the museum represent a nationally recognized scientific research resource that has fueled a tremendous amount of original research while providing the raw material for hundreds of UF graduate theses and dissertations. These collections represent the natural history heritage of Florida and surrounding regions and have stimulated the museum's investment in the field of bioinformatics. **Informatics**—the science of the analysis, storage, and management of

data—is permeating all areas of science and is particularly important in unifying broad areas of the biological sciences. This synthetic field draws on computer science and computational biology to empower new science using archived and current empirical data from diverse fields. The combination of archived data and new computational tools is leading to breakthroughs in genetics, medicine, agriculture, and other areas. Equally spectacular is the promise of harnessing the information held in natural history museums worldwide for solving problems in biodiversity sciences, conservation, and anthropology. Information from natural history collections is being used to track and predict the spread of disease, assess the impact of climate change, and formulate hypotheses on the origin and extinction of biological and cultural diversity.

The FLMNH ranks 4th or 5th nationally in terms of collection size with ca. 28 million specimens and artifacts. Coupled with the Florida State Collection of Arthropods (>8 million specimens) held by the FL Department of Agriculture in the adjacent Doyle Conner Building, Gainesville is home to the second largest natural history collections in the country, behind only the Smithsonian. However, we rank 18th nationally in the number of specimen records served through the Global Biodiversity Information Facility in Denmark (<http://www.gbif.org>), the primary international web data outlet for museum collections. If we were to make our existing computerized records accessible, we would rank 1st nationally in the amount of information served to the public (and thus available to scientists and public servants). Our lack of dissemination is the result of our shortcomings in informatics staff and expertise.

UF, with FLMNH in a leadership position, is uniquely poised to be THE national leader in biodiversity and environmental biology. The size and importance of the FLMNH collections, the university setting that allows for student training, the broad strength of UF with excellent associated departments of Anthropology, Botany, Entomology & Nematology, Fisheries, Geology, Horticulture, Wildlife Ecology & Conservation, and Zoology, as well as centers of excellence like the UF Genetics Institute, are unique worldwide. The main missing component is strength in collection-related informatics. The tremendous success of UC-Berkeley and the University of Kansas as national leaders in biodiversity, despite their less important collection and curatorial resources, is the direct result of the investment they have made in informatics. Through strategic hirings and new collaborations, FLMNH could attain a leadership role on an international scale.

Collections-based informatics in anthropology and archaeology is not currently as advanced as bioinformatics. Distributed databases, now the norm in bioinformatics, have not yet been established in anthropology, and a comparatively modest investment in personnel and infrastructure would yield great rewards for this field, again placing FLMNH and UF at the forefront of the national scene. Furthermore, the development of appropriate databases and computational tools would allow for new collaborations between biologists and anthropologists as the data could be viewed from both perspectives. For example, human impact studies are very important in conservation efforts and benefit from both anthropological and biological data. Such integrated studies are currently very difficult but could be promoted through enhanced informatics resources. Such interdisciplinary research also could extend to other departments beyond FLMNH.

The biodiversity crisis and global change make access to information in natural history collections more important than ever. As a result, agencies such as NSF are providing additional funds for informatics initiatives that make collection information widely

accessible. Most recently, NSF announced a call for proposals to develop a nation-wide cyberinfrastructure for the plant sciences. The successful proposal will receive \$50 million over five years, with the likelihood of an additional \$50 million over the five subsequent years. Although funding opportunities for informatics are increasing, FLMNH could be better poised to attract these new funds if appropriate expertise and infrastructure were available to guide new efforts. Again, a relatively modest investment could yield an enormous return on investment.

In FY 05/06 FLMNH faculty and staff produced 142 refereed scientific and technical publications, as well as 61 publications for the lay public. Faculty received \$2.1 million from 28 new grants and contracts that, with continuing multi-year awards, brought a total of \$3.7 million to UF in extramural grant support. Our expectation is that these totals should rise each year, a result that is guaranteed if our Informatics initiative is successful.

- **Service:** Faculty and staff serve the UF community as well as the citizens of Alachua County and the State of Florida in a variety of ways. Last year 202,000 individuals visited the museum's exhibit center and more than 172,000 were touched by its outreach programs. Over 34,000 visitors participated in museum educational programs last year such as curriculum-based school tours, kids' summer camps, teacher and adult workshops, weekend and holiday classes, and outreach programs to community centers. Nearly 19,000 adults and children participated in public programs such as Collector's Day, Celestial Celebrations, Earth Day, Science Sundays, Wigglers & Walkers, etc. More than 15,000 preK-12 students benefited from the Museum on the Move Inquiry Box programs at their schools. The Museum Volunteer Program saw 300 volunteers contribute 42,400 hours of service in FY 05/06 while the Financial Assistance Program, supported by individuals, corporations, and foundations, made it possible for 1,800 needy individuals to attend fee-based activities at no cost.

The FLMNH also serves the scientific community as well as the citizenry of Florida. Last year the museum made nearly 700 outgoing loans of scientific specimens (>10,000 objects) to institutions and investigators around the world. In the same period, over 600 scientific visitors used the collections located in Dickinson Hall. FLMNH scientists conducted research projects in 34 counties in Florida, 16 states across the nation, and 21 foreign countries.

Personnel from the FLMNH serve the museum field in leadership capacities in a number of contexts. Dr. Graig Shaak recently completed his term as President of the Southeastern Museum Conference. Dr. Douglas Jones just began a two-year term as President of the Florida Association of Museums and serves on the National Board of Directors of the Natural Science Collection Alliance. Several faculty members also serve in leadership capacities in their respective professional societies (e.g., Pam Soltis, President of Botanical Society of America; Bruce MacFadden, President of Society of Vertebrate Paleontology).

A major area of service involves the tremendously popular FLMNH web site, which boasts over 20,000 pages of content. Last year the FLMNH web site had 14.4 million visits, more than the ufl.edu web site. The site averaged 39,300 visits per day, viewing 31.5 million web pages at an average duration of 12 minutes at the site. UF has 650 sub-sites (e.g. flmnh.ufl.edu, harn.ufl.edu, law.ufl.edu, etc.). The top five most popular web sites at UF (with percentage of total visitation) are: 1) ifas.ufl.edu (16%); 2) **flmnh.ufl.edu (7%)**; 3) ufl.edu (5%); 4) clas.ufl.edu (4%); 5) plaza.ufl.edu (3%). The most popular pages are those of the Florida

Program for Shark Research. This group investigates shark population dynamics, over-fishing and conservation, and hosts the International Shark Attack File for scientists and the public around the globe.

The museum's Center for Informal Science Education (CISE) expanded its highly acclaimed educational outreach programs last year, most notably *MESS: Marvelous Explorations through Science and Stories*. *MESS* is a multi-faceted program that includes a science-centered curriculum, teacher training and coaching, and family engagement. Using a clinical trials methodology, *MESS* was implemented in 14 Head Start classrooms in Marion County and a variety of outcomes are being investigated for *MESS* and non-*MESS* classrooms. The project partners include Childhood Development Services, Inc. of Marion County (a Head Start provider), Marion County Public Library System, Silver River Museum and Environmental Education Center, and Marion County Public Schools. The three-year implementation award from the Administration for Children and Families for Marion County *MESS* will total more than \$1.1 million and represents one of eight awards nationally from 700 initial applicants.

MESS in Alachua County is a collaborative program with the Alachua County Public Schools Head Start/School Readiness and Alachua County Library District/Youth Services, with funding provided by a Learning Opportunities Grant from the Institute for Museum and Library Services. Alachua County *MESS* received the Head Start Region IV Family Literacy Award and the National Head Start Family Literacy Award. It has been implemented at 11 sites in Alachua County where it serves over 1,000 Head Start children and their families.

Our service goals and expectations are always to exceed the accomplishments of the prior year in both quantity and quality. In areas of scientific and professional service such expectations are justified. However, because of space and staff limitations, our K-12 educational programs and summer camps are maxed out.

- **Diversity:** The FLMNH is committed to diversifying its faculty, staff, volunteers, audience, and programming. Progress has been slow at the faculty level where recruitment of diverse professional curators has been a challenge. Nevertheless there is a great likelihood that we can add a Latino and Pacific Islander to the faculty in the year ahead. Recruitment of diverse staff and volunteers has gone more smoothly such that a balance reflective of the surrounding community has been achieved.

The Board of the Florida Museum Associates has been aggressive in its pursuit of diversity, ably assisted by Ms. Joyce Daniels. Great progress has been achieved in this realm as well. Diversifying our audience is also a clear goal in the museum's strategic plan. Programs such as *Motown at the Cultural Plaza* and traveling exhibitions such as *Inside Africa* next year are moving us in this direction.

- **Fundraising:** Development is crucial to the FLMNH. About 30% of the museum's annual revenue comes from gifts and investment income. There is no alternative but to be successful at fundraising if the museum seeks to grow its programs and expand its reach. Last fiscal year fundraising activities yielded \$3.5 million for the museum. The museum's goal in the *Florida Tomorrow* UF Capital Campaign is currently \$18 million and as of January 2007 we are at 34% of this total. We anticipate the goal will be raised by the UF Foundation.

The primary emphasis in the museum's capital campaign focuses on institution strengthening through endowments, professorships, and student fellowships. We also have identified some capital renovation projects to improve our physical plant. Should a major, lead donor surface during the course of our campaign, we are refining plans to move the Collections and Research facilities from Dickinson Hall and integrate them with the public facilities at the 34th Street site. However, such a project has a price tag that exceeds the goals of our present capital campaign.

3. Strategic Fit to the University and Board Strategic Plans

The FLMNH's Institutional Plan is compatible with, and complementary to, the UF Strategic Work Plan and the Board of Governor's SUS Strategic Plan 2005-2013. With respect to the Goals and Principles of the former, the FLMNH is positioned to contribute substantially toward the following goals.

Quality of Life – Work with surrounding community and City of Gainesville to improve quality of life. This goal is accomplished through changing exhibitions, educational classes, school tours that attract 45,000 K-12 children per year, in school programs, special programs and events, etc.

Students – Provide a wide range of excellent co-curricular / extra-curricular activities to maximize students' development. Examples include Museum Nights, Science Sundays, use of exhibitions for teaching and leisure activities, sustainability lecture series, etc.

Graduate and Professional Students – Increase the size and quality of graduate and professional programs. The FLMNH supports many graduate students on research assistantships and is seeking to increase its number of RAs as a major goal in the current capital campaign.

Information Technology – Review IT needs and develop state-of-the-art IT infrastructure. The FLMNH is a campus leader in IT, boasts an extremely large and popular web site, and seeks to expand its efforts in Informatics as elaborated elsewhere in this document.

In terms of Strategies for Maximum Impact in the UF Strategic Work Plan, the FLMNH aligns principally with the following four:

#2) Internationalization. The FLMNH has MOUs with several foreign universities and governments. Museum researchers carried out projects in 21 foreign countries last year, all of which involved UF students and faculty. The FLMNH sees its geographic emphasis as including the tropical and subtropical zones of the New World and anticipates expanding in this region.

#3) Life Sciences. With 28 million specimens, UF has the 1st or 2nd largest collection of organisms associated with any university in the nation (only Harvard may be larger). This enormous research resource attracts thousands of scientists and students each year from the life science disciplines of zoology, botany, paleontology, molecular genetics, evolutionary biology, phylogenetics, developmental biology, biogeography, and many others. The FLMNH collections represent one of the largest inventories of life on Earth.

#4) Ecology and the Environment. The FLMNH is at the center of biodiversity studies at UF, investigating the interaction of organisms (including humans) and the natural environment. The collections and their computerized databases are an unparalleled resource.

Current FLMNH research in the news involving shark conservation, human-induced bird extinctions on Pacific Islands, endangered Florida butterfly species, invasive reptiles in the Everglades, coral reef declines in the Pacific, and the history of El Nino in Peru, illustrates the involvement of museum researchers in this field as well as the impact of their work.

#12) Education, Children, Families. The museum offers extensive and diverse education programs at Powell Hall for children and families whenever the public schools are not in session. In addition, school tours bring thousands of pre K-12 children to the museum each year. The Inquiry Boxes: Museum on the Move initiative brings the museum to schools that are unable to visit the museum. Special programs and events designed for families such as the Butterfly Festival, the Discovery Room, Walkers and Wigglers, and many more, serve children and families. The *MESS* initiative discussed above under Service, and the *WINGS* initiative described below under Partnerships, work with Head Start children and families and 4H youth and families, respectively, to develop a love of learning.

In terms of aligning with the goals of the Board of Governors' SUS of Florida Strategic Plan, the FLMNH complements Goal #3: Building world-class academic programs and research capacity and Goal #4: Meeting community needs and fulfilling unique institutional responsibilities.

4. FLMNH Core Achievements in 2006-07

Accreditation: The FLMNH has been accredited by the American Association of Museums (AAM) since 1973, one of the first university museums in the nation to achieve that distinction. In preparation for our third re-accreditation, we completed AAM's Institutional Self-Study in October 2006 after a year-long, organic, committee-driven process. This self-study was a terrific exercise in introspection and evaluation. After responding to initial feedback from AAM in early 2007, the FLMNH is ready to proceed with the re-accreditation process. The site assessment team will be visiting later in 2007. The FLMNH is widely considered a national model for university-based natural history museums.

Assumption of Management of the *Butterfly Rainforest*: The FLMNH, in cooperation with the UF General Counsel and independent counsel, entered into an agreement to dissolve the management contract purchased two years ago during the start-up of the *Butterfly Rainforest*, and to assume management in-house. The contract was limiting and not particularly advantageous for the FLMNH. The museum developed a management plan that has proven more expeditious for the staffing and long-term financial stability of the *Butterfly Rainforest* auxiliary. Attendance at the *Butterfly Rainforest* was 112,860 for FY 05/06, and its popularity continues to grow.

Development and Fundraising Success: The FLMNH secured \$3,491,597 in private support during the last fiscal year. Of that amount 70% was given by friends or non-alumni, 16.5% by foundations, 9.8% from UF alumni, students and parents and about 3% by corporations. Of note were endowment gifts of \$500,000 and \$400,000, respectively, to support shark research and educational outreach programs for Head Start children. The museum's fundraising goal for FY 06/07 is \$4 million. To date we have already secured several endowment gifts and a pledge of \$1.5 million to establish the Jon & Beverly Thompson Chair in Invertebrate Paleontology. In addition we anticipate receiving several large collection gifts of specimens this year.

Grants and Contracts Success: Extramural grants for FY 05/06 totaled \$3,707,100 of which \$2,090,500 were new awards. These grants generated \$472,200 in IDC for the university. While pleased with this total and the level of success it indicates, our goal always is to increase the

level of external support. Grants and contracts account for approximately 20% of the total revenue received by the FLMNH in any given fiscal year.

Research Accomplishments: Biodiversity is one of the most important topics of the 21st century and nowhere is this more apparent than in Florida. In addition to publishing a record number of papers in scientific journals, our researchers have led the way in biodiversity studies. Whether bringing back endangered populations of butterflies such as the Schaus Swallowtail or the Miami Blue from the brink of extinction, assessing the influx of invasive reptiles into the Everglades, or demonstrating the plight of over-fished sharks in Florida waters, FLMNH scientists made remarkable research contributions this past year. With 28 million specimens in its collections (including the largest Lepidoptera collection in the world), its enormous electronic databases, and the vibrant Molecular Systematics and Evolutionary Genetics Laboratory, the museum represents one of the greatest biodiversity resources available. Our goal is to have the museum recognized and used more widely as a locus for biodiversity research.

5. FLMNH's Challenges

Informatics Staffing: The Natural History Department and Director's Office recognize the enormous potential for research, grants and contracts, fundraising, and campus-wide partnerships with a high-powered informatics program. Section 2 (**Research**) above describes this potential. We seek a dynamic faculty member to lead this informatics initiative. A minimal investment of sufficient rate to fill one position clearly would put the museum and university in a preferred position. This is an opportunity for a modest investment to be multiplied several-fold through anticipated grant support. We have identified top candidates and will begin the process of assembling a recruitment package almost immediately.

Dickinson Hall Fire Code Violations: We now have seven years remaining on the 10-year variance issued by the State Fire Marshall. All possible fire suppression recommendations have been instituted in Dickinson Hall. The sizable natural history collections stored in alcohol need to be moved or proper storage has to be provided. If the code violations are not resolved, Dickinson Hall will be closed to staff, students, and visitors. Access will be restricted to care and conservation of the collections only. The present building restrictions are stifling to our education programs and solutions need to be discussed in conversations at a high university level.

Powell Hall Renovations and Auditorium Addition: The museum has identified prospects interested in reconfiguring the entrance to Powell Hall, adding a much-needed auditorium, additional education and retail space, and increasing office space. Preliminary plans are being drafted by Facilities Planning and Construction.

New Research and Collections Facility: The museum hopes to identify prospects interested in providing the leadership gift(s) for construction of a 150,000 to 200,000 sq/ft facility to house the collections and research functions and unite all campus-wide FLMNH operations.

Staffing of the *Butterfly Rainforest*: Our major donor is considering an additional \$350,000 in funding initiatives. He is extremely pleased that the museum took over the management of the operation while recognizing that staffing concerns exist. Currently, the acting Vivarium Manager and Assistant Director of the McGuire Center (one position, time-limited) has been pirated from other McGuire operations. We absolutely need to make this position permanent to insure the maintenance and continuity of the physical plant conditions in McGuire Hall, outside

of the auxiliary. These include security, the delicate climate control in the collection areas, the life support systems in the vivarium, the greenhouse facilities, and the cryogenic facilities. Our benefactor is withholding his decision until the staffing issue is resolved.

6. FLMNH Improvement Strategies

Promote Internationalization: Provide incentives to faculty to compete for grants and contracts in support of a more focused international effort.

Enhance Faculty and Staff Diversity: current and future searches target minorities and underserved populations. The museum has identified extraordinary candidates that would greatly balance the museum's faculty and staff diversity as well as build on and enhance existing strengths.

Grow FLMNH Research Programs in Informatics and Molecular Systematics / Evolutionary Genetics: Invest internally and partner with Academic Affairs and perhaps Sponsored Research to position the museum and university to compete for NSF mega-grants for which the museum has been invited to apply.

Grow the number of graduate assistantships the FLMNH can offer: The museum is exploring the conversion of operating dollars for graduate assistantships. The faculty are anxious and well prepared to train our future biologists, paleontologists and anthropologists.

Increase visitation at EPP and broaden audience to include under-served communities: Increased diversity on the Museum's Board of Directors will pay dividends as the museum plans for new educational programs and exhibits. The Butterfly Rainforest is becoming a statewide attraction and visitation will continue to grow. The Alachua County Visitors and Convention Bureau has designated the Butterfly Rainforest as the primary attraction in Alachua County.

Increase awareness of FLMNH on campus and around state: The museum has hired WordOne, a regional specialist in marketing and public relations to assist in branding the museum. The success of the museum's produced traveling exhibits and public programs have statewide application as well as the scientific and popular publications. The museum's public relations efforts have earned the museum a greater exposure to its audiences.

7. The Culture of the FLMNH

One of the smaller colleges/units at UF, therefore culture of shared governance, team spirit, and common purpose that is more difficult to achieve in larger, less focused units. The museum is committed to, and invests heavily in, professional and career development for the faculty and staff.

Culture of academic excellence - FLMNH widely acknowledged as leader among university natural history museums and faculty/staff are committed to excellence. Examples; Dilcher and Wing in National Academy of Sciences (8% of our faculty); Pam Soltis Dahlgren Medal winner

Culture of service to UF, scientific community, citizens of Florida through exhibits and public programs, popular publications, lectures and other presentations and active participation in the various professional societies both in the museum field and the natural science disciplines.

Mentoring of Undergraduate and Graduate Students are heavily valued -- for example, University Scholars for 06/07FY: Jack Stoetzel: Project title - Pre-Columbian Residence Patterns of Calusa Peoples as Determined by Fish Remains, Anthropology; Jonathan Sanders: Project title - A preliminary phylogeny of the Riordinidae using DNA sequence data, Wildlife Ecology and Conservation; Tamar Elizabeth Carter: Project not yet titled, Zoology.

FLMNH Intellectual Life: The museum's faculty and staff have embraced the UF Shared Governance initiative. Faculty and staff are encouraged to serve on internal and external committees. In particular, the Museum's Health & Safety Committee has been active and well educated in laboratory safety, fire exit drills, AED's, and first aid. Museum faculty and staff are encouraged and supported whenever possible to participate in career development and membership and service in professional societies.

FLMNH Partnerships: The FLMNH loaned 6.0 FTE to other academic units in FY 05/06 in support of the teaching enterprise of the University.

Teach and mentor grad students in 1) CLAS (anthropology, botany, geology, zoology); 2) IFAS (entomology & nematology, wildlife ecology & conservation) and 3) CFA (museum studies)

UF Genetics Institute (molecular systematics and evolutionary genetics)

Project Butterfly WINGS: Winning Investigative Network for Great Science is a field- and web-based citizen science project that engages 4-H youth in grades four through eight in the study of butterflies. *WINGS* is a collaborative project with IFAS's Department of Wildlife Ecology & Conservation.

Harn Museum and Student Government – Museum Nights

Harn Museum and CPA (Phillips Center) at UF Cultural Plaza – joint programming

8. Budget Requests for New Funding in 2007-08

- \$100,000 rate for Associate Curator of Bioinformatics – 1.0 FTE, will be matched by FLMNH who will cover start-up costs, deal with dual-career family issues, and hire a Database Programmer for the museum's Office of Museum Technology to provide informatics infrastructure support. This is the museum's highest priority and should prove to be a sound investment and not a gift. The informatics principals are confident that the grant proposal will be competitive with the best in the country.
- \$75,000 rate for a systems engineer/manager for the Butterfly Rainforest – 1.0 FTE. The complex environmental systems are beginning to show wear and tear. It is imperative that the museum invest in deferred maintenance and recruit a specialist that can maintain the systems and divert problems and malfunctions. Although the museum's second priority, we feel strongly about this request as it has a direct bearing on proposals currently held by Bill McGuire and family. We are confident that the addition of this position will trigger the awarding of \$350,000 in new gifts. Also, Bill McGuire is being cultivated for facilities, renovations and new construction, all components of the museum's strategic plan. He believes very firmly that the university should be a stronger partner to the Butterfly Rainforest and McGuire Center.

