

**ANNUAL REPORT: June 1, 2014 – May 31, 2015**  
**(i.e., Summer 2014, AY 2014-2015)**  
**DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY**  
**SUNY-ESF**

**NAME:** Danilo D. Fernando

**I. INSTRUCTIONAL ACTIVITIES**

1. Regular Course Offerings

	<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>	<u>No. of Lab. Sections</u>
SUMMER:					
FALL:	EFB 427/627	Anatomy and Development of Plants	3	24	2
SPRING:	EFB 326	Diversity of Plants	3	62	4
	BTC 497	Research Design & Prof Devt	1	15	0

**NOTE: PLEASE INDICATE WHICH COURSE(S) HAD A SERVICE-LEARNING COMPONENT AND BRIEFLY EXPLAIN THE NATURE OF THIS COMPONENT.** For examples of service-learning in courses, see: <http://www.esf.edu/students/service/courses.htm>. Service-learning is a form of structured experiential education in which students engage with the community to be active learners, to enrich their sense of civic responsibility, and to explore practical application for course content. Faculty oversight, reflective thinking, and reciprocity are key components of service-learning.

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

	<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>
Fall 2014				
	BTC 498	Research Problem/Biotechnology	3	1
	EFB 495	Undergraduate Exp/Coll Teaching	3	1
	EFB 498	Independent Research/Envi Bio	2-5	2
	EFB 899	Masters Thesis Research	1-5	3
Spring 2015				
	BTC 498	Research Problem/Biotechnology	3	1
	EFB 495	Undergraduate Exp/Coll Teaching	3	3
	EFB 498	Independent Research/Envi Bio	2	2
	EFB 899	Masters Thesis Research	3-4	3

3. Continuing Education and Extension (short courses, workshops, etc.)

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4. Guest Lecture Activities

	<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
	EFB 210	Diversity of Life	2
	EFB 535	Flowering Plants: Diversity, Evolution and Systematics	1

## II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor 16 and unofficial advisor 0
- B. Graduate Students: (list name, degree sought, starting date, month & year; if a degree was completed, please give date and full citation for the thesis or dissertation).

### MAJOR PROFESSOR

Rie Iriyama, MPS, Started on August 2011, finished on December 2014. Internship project:  
Expression pattern correlation between miRNAs and their target transcripts.

Jennifer R. Potrikus, MS, Started on August 2013, finished on May 2015. Ecological and Genetic  
Analyses of *Actinidia arguta* (hardy kiwi) in the Northeast United States.

Michael J. Serviss, MS Program, Started on August 2014

Joshua Weber-Townsend, MP Program, Started January 2015.

### CO-MAJOR PROFESSOR

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### MEMBER, STEERING COMMITTEE (other than those listed above)

Pallavi Subramanya Bharadwa, Ph.D Program, Started on August 2012 – Biology Dept, SU

Yao Xiao, Ph.D Program, Started on August 2013 – Biology Dept, SU

### CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Served as Chair to MS thesis defense of Vignesh Gnanavel, Bioprocess Engineering. April 22, 2014.

## III. RESEARCH COMPLETED OR UNDERWAY

- A. Departmental Research (unsupported, boot-legged; title - % time spent)

Cloning and bioinformatic analysis of microRNAs from germinated pine pollen (10%)

Development of a microgenomic approach to analyze single germinated pollen (10%)

- B. 1. Grant-supported Research (source, subject, amount - total award and current year, award period starting and ending dates; list graduate research assistants supported by each grant)

Genetic Diversity, Morphometrics, and Habitat Analysis of a Rare Fern in the Northern Forests:  
Implications for Management and Long-Term Survival. USDA Forest Service Northeastern States  
Research Cooperative. Budget Supplement for extension to September 1, 2014 to August 31, 2014.  
\$3,000. PI: DD Fernando, Co-PIs: DJ Leopold and SW Bailey.

Genetic, Reproductive and Habitat Analysis to Support American Hart's-Tongue Fern Reintroduction and Restoration in the Great Lakes Region. USF&WS-GLRIP, \$99,600. May 1, 2012 to June 30, 2014. PI: DD Fernando, Co-PI: DJ Leopold. This project has been extended to June 30, 2015 to cover the reintroduction aspect of the project.

Reproductive, Genetic and Ecological Assessments of the Invasive Potential of Hardy Kiwi (*Actinidia arguta*) in the Northeast United States. Natural Heritage Program – NYSDER LIISM. \$75,062. January 1, 2014 to December 31, 2015.

2. Research Proposals pending (include information as in B.1., above).

Genetic Analyses of American Hart's-Tongue Fern (*Asplenium scolopendrium* var. *americanum*) - Part II: Michigan, Tennessee, Alabama and Ontario (Canada). USF&WS Cortland Office; \$18,923. Research Assistant: Joshua Weber-Townsend (summary salary). PI: DD Fernando.

Ex situ conservation of American hart's-tongue fern. Sponsor: Landscape Architecture WMBE; \$10,000. PI: DD Fernando and co-PI: DJ Leopold.

3. Research Proposals submitted, but rejected (include information as in B.1, above)

Effect of Climate Change on Complex Flowering Phenologies: Sugar Maple as a Model System. McIntire Stennis, September 2014. PI: DD Fernando.

#### IV. PUBLICATIONS (Full bibliographic citation, i.e., do not use "with Jones," or "Jones, et al."; please list only publications published, in press, or actually submitted during this reporting period --- **do not list manuscripts in preparation**).

##### A. Refereed Publications

Kapuscinski K, Farrell J, Stehman S, Teece M, Boyer G, Fernando D and Tschaplinski T. 2014. Selective Herbivory by an Invasive Cyprinid, the Rudd *Scardinius erythrophthalmus*. *Freshwater Biology* 59: 2315–2327.

Quinn CR, Iriyama R, Fernando DD. 2015. Computational Predictions and Expression Patterns of Conserved MicroRNAs in Loblolly Pine (*Pinus taeda*). *Tree Genetics and Genomes* 11:806.

Fernando DD, Discenza JJ, Bouchard JR, and Leopold DJ. Genetic Analysis of the Threatened American Hart's-Tongue Fern (*Asplenium scolopendrium* var. *americanum*) and Insights into its Rarity and Persistence. *Biochemical Systematics and Ecology* (in review).

##### B. Non-refereed Publications

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##### C. Papers Presented at Science Meetings (give title, date, occasion, and location)

- Fernando DD, JR Potrikus and S Young. Insights into the Ecology and Genetics of Hardy Kiwi (*Actinidia arguta*) in the Northeast United States. Long Island Natural History Conference. March 20-21, 2015. Presenter: S Young.
- Bailey SW, JR Bouchard and Fernando DD. *Dryopteris fragrans*: Status, Habitats, and Genetics of a Northern Plant at its Southern Limits. Northeast Natural History Conference, Springfield MA. April 22-24, 2015. Presenter: SW Bailey.

D. Public Service Presentations (lectures, seminars, etc. to and for the public; give group or occasion, date(s), and attendance)

- Genetics and Reintroduction of American Hart's-Tongue Fern, 9 April 2015. AHTF Meeting @ SUNY-ESF.

## V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local):
2. Industrial and Commercial Groups, etc.

B. Unfunded Service to Governmental Agencies, Public Interest Groups, etc.

National Science Foundation, Division of Integrative Organismal Systems: Panel Member (Oct 2014).

## VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)

- B. 1. Activities in Professional Organizations (offices held, service as chairman, member, participant or consultant)
2. Professional Society Membership
3. Other Professional Activities

a. Editorial activity

Journal (s)

Responsibility

Other (books, symposia, etc.)

b. Reviewer

Journal(s)

No. of manuscripts

Canadian Journal of Botany  
Molecular Biology Reporter  
Torrey Botanical Society  
Tree Physiology

1  
1  
1  
1

Agency

No. of proposals

NSF

10

Other

c. Participation (workshops, symposia, etc.)

Name of workshop, etc.

Date

Place

C. Further Education/Re-training Undertaken, Leaves, Workshops, etc.

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D. Foreign Travel (Where, When, Purpose)

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**VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)**

A. Department-level

Director, EFB Graduate Program  
Member, Graduate Program Advisory Committee  
Chair, Joseph and Ruth Hasenstab Memorial Fellowship Award Committee  
EFB New Graduate Student Orientation, August 22, 2014  
Open House & Accepted Student Reception, April 11, 2015

B. College-level

Member, Graduate Council  
Northeast Graduate School Virtual Fair, EFB Representative, April 22, 2015

C. University-wide, including Research Foundation

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**VIII. SUMMARY OF SIGNIFICANT ACTIVITIES AND ACCOMPLISHMENTS DURING THIS REPORTING PERIOD, ESPECIALLY THOSE MOST NOTEWORTHY AND RELATIVE TO THE COLLEGE'S AND DEPARTMENT'S MISSION.**

**One paragraph on each of the following (i.e., three paragraphs total) would be most helpful:** this past year, what have you done for our students, department/college, and self professionally? NOTE: The information in this section (along with the supporting specific information elsewhere in this report) should be your strongest case for being considered for a discretionary raise (when available), which I'll continue to award based on your contributions to the department and college this reporting period.

For the Students: This past academic year, I taught EFB 427/627 (Anatomy and Development of Plants), EFB 326 (Diversity of Plants), BTC 497 (Research Design and Professional Development), EFB 495 (Undergraduate Experience in College Teaching) and BTC/EFB 498 (Independent Research in Biotechnology/Environmental Biology), and in total, 112 undergraduate students have been served through this capacity. I did not have a graduate Teaching Assistant for EFB 427/627 which had two lab sections and a total of 24 students, which meant that I did the pre-lab preparations, actual lab instructions of at least 6 hours per week, and marked all of the lab reports (5 per student) for this course. In addition to the formal interactions with the students in all the courses I taught this past academic year, I also interacted with many of them out of the lecture and lab periods through involvement in their respective lab projects and/or writing assignments. Many of the students also came in during my office hours for clarifications, questions and/or conversations on various topics including practical applications of concepts covered in the lectures and labs. I updated the laboratory manuals in both of my major courses (Plant Anatomy & Development, and Plant Diversity) and the revisions included suggestions from the graduate and undergrad TAs, as well as from the students who went through them. I have trained several undergraduate students in my lab through independent research and internship and presented invited lectures to other courses here in ESF. I advised at least 16 undergraduate students in various aspects of their curriculum. As for graduate students, I have advised many graduate students from the department regarding

their program requirements, filing up of the required forms and shifting from one major or degree program to another. I have worked with my graduate students on various aspects of the laboratory and/or field components of their research projects, draft manuscripts, grant/fellowship applications, and poster/oral presentations.

For the department/college: I served as EFB's Graduate Director for the 8<sup>th</sup> year and my major responsibilities included the following: 1) acted on various petitions concerning different aspects of EFB graduate program requirements and policies; 2) reviewed and signed on various forms required for the completion of different degrees and majors (e.g., 2A, 3B, 4 and 6A); 3) replied to inquiries concerning EFB graduate program (through email, phone, and/or personal appearances) from several potential applicants and current graduate students; 4) learned and assisted the EFB faculty with the new online graduate application system (Hobsons' AppReview); 5) processed a total of 127 applications (18 for spring 2014 and 109 for fall 2015) that involved the review of each application for initial assessment and designation of faculty reviewers, followed up on the completion of the reviews on each application, summarized the reviews for each application, and submitted EFB's recommendation for each accepted and rejected applications to the Dean of Instructions and Graduate Studies; 6) provided informal orientation to new graduate students regarding EFB graduate program and new faculty about the graduate application and review procedures; 7) I also worked with EFB Secretaries on the update and improvement of the various facets of the EFB's Graduate Webpage, graduate application filing system, and continued the survey on the most effective means of attracting/recruiting graduate students; and 8) As a member of EFB's Graduate Program Academic Committee and ESF's Graduate Council, I provided connections between the department and college on issues pertaining to graduate degree program offerings and requirements, admission/review process, policies, and other related matters.

For professional accomplishments: The following are what I consider as significant: 1) Successful completion of my 5<sup>th</sup> Master of Science student - Jennifer R. Potrikus (Fall 2013 to Spring 2015); 2) Successful completion of my 3<sup>rd</sup> Master of Professional Student - Rie Iriyama (Fall 2011-Fall 2014); 3) Recruitment of two new Master of Science students (Michael J. Serviss and Joshua Weber-Townsend) to work on American hart's-tongue fern reintroduction and reproductive mechanisms, respectively; 4) Publication of two papers, particularly the co-authorship with my former graduate students - Quinn CR, Iriyama R, Fernando DD (2015) on Computational Predictions and Expression Patterns of Conserved MicroRNAs in Loblolly Pine (*Pinus taeda*), Tree Genetics and Genomes 11:806; 5) Invited as Panel Review Member for NSF's Plants, Fungi and Microbial Evolution and Developmental Mechanisms; 6) Organized a meeting on American hart's-tongue fern re-introduction, with participants from government agencies such as DEC and USF&WS; and 7) last but not the least, I have continued writing and editing the chapters of the textbook (Sexual Reproduction in Forest Trees) that I am co-authoring with Dr. John Owens through Cambridge University Press.

## **IX. A. FUTURE PLANS, AMBITIONS, AND POTENTIAL CONTRIBUTIONS FOR YOUR OWN PROFESSIONAL DEVELOPMENT AND THE ENHANCEMENT OF THE PROGRAM IN ENVIRONMENTAL AND FOREST BIOLOGY (brief summary)**

### **B. PROJECTED ACTIVITIES FOR NEXT YEAR**

#### 1. Summer 2015

##### a. Course(s) to be offered

##### b. Proposed research activity

Genetics, Breeding System and Reintroduction of American hart's-tongue fern

Genetics, Ecology and Reproductive Biology of *Actinidia arguta* in the Northeast US

Write papers and grant applications

Finalize and Submit book – Sexual Reproduction in Forest Trees

c. University, professional society, and public service

2. Fall Semester 2015

a. Course(s) to be offered

EFB 427/627: Plant Anatomy and Development

b. Proposed research activity

Genetics, Breeding System and Reintroduction of American hart's-tongue fern

Genetics, Ecology and Reproductive Biology of *Actinidia arguta* in the Northeast US

Write papers and grant applications

Finalize and Submit book – Sexual Reproduction in Forest Trees

c. University, Professional society, and public service

3. Spring Semester 2016

a. Course(s) to be offered

EFB 326: Plant Diversity

BTC 497: Research Design and Professional Development

b. Proposed research activity

Genetics, Breeding System and Reintroduction of American hart's-tongue fern

Write papers and grant applications

c. University, professional society, and public service