

**ANNUAL REPORT: June 1, 2013 – May 31, 2014**  
**(i.e., Summer 2013, AY 2013-2014)**  
**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:   | -                 | -                                     | -                  | -                   | -                           |
| SPRING: | EFB 326           | Diversity of Plants                   | 3                  | 56                  | 4                           |
|         | BTC 497           | Research Design and Professional Devt | 1                  | 14                  | 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:   |                   |                                       |                    |                     |
|         | EFB 498           | Independent Research/Envi Bio         | 3                  | 1                   |
|         | EFB 899           | Masters Thesis Research               | 1                  | 2                   |
| SPRING: |                   |                                       |                    |                     |
|         | EFB 495           | Undergraduate Experience/Col Teaching | 3                  | 6                   |
|         | EFB 498           | Independent Research/Envi Bio         | 3                  | 1                   |
|         | EFB 899           | Masters Thesis Research               | 1                  | 2                   |

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

None

#### 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                      |
| BIO 340           | Plant Kingdom (at SUNY Oswego)                         | 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

Jessica R. Bouchard, MS, Degree completed on November 2013. Thesis title: "Genetic and Phenotypic Diversity of *Dryopteris fragrans*, a rare fern in the temperate forests of the Northeastern United States.

Rie Iriyama, MS Program, Started on August 2011.

Jennifer R. Potrikus, MS Program, Started on August 2013.

### CO-MAJOR PROFESSOR

Stephanie Smith, MPS, Degree completed on December 2013.

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

Nikhilesh Dhar, Ph.D. Program, Started on August 2006 – Biology Department, SU

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.

Thomas Brumbelow, MS Thesis Defense, External Examiner

## III. RESEARCH COMPLETED OR UNDERWAY

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

Cloning and bioinformatic analysis of secreted proteins from pine pollen tubes (10%)

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

Development of a pollen derived cell line from Ginkgo (10%)

In vitro regeneration and transformation of willow (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, \$82,876. September 1, 2011 – August 31, 2013. PI: DD Fernando, Co-PIs: DJ Leopold and SW Bailey. Arnold Salazar (PhD student, supported for one-month) and Jessica Bouchard (MS student, supported for three semesters) and one week for summer 2013.

USDA Forest Service Northeastern States Research Cooperative (same project as above) Budget Supplement for extension to September 1, 2014 to August 31, 2014. \$3,000.

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. Grad Students: Thomas Brumbellow and Rie Iriyama (both are MS students and each supported for two semesters). This project has been extended to June 2015.

Reproductive, Genetic and Ecological Assessments of the Invasive Potential of Hardy Kiwi (*Actinidia arguta*) in the Northeast United States. Natural Heritage Program – NYSDDED LIISM. \$75,062. January 1, 2014 to December 31, 2015. Research Specialist Supported (Jessica Bouchard). Graduate Student (Master of Science) Supported (Jennifer Potrikus for Summer 2014).

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

None

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

None

**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

Fernando DD. 2014. The Pine Reproductive Process in Temperate and Tropical Regions. *New Forests* 45:333–352.

Quinn CR, Iriyama R, Fernando DD. 2014. Expression Patterns of Conserved MicroRNAs in the Male Gametophyte of Loblolly Pine (*Pinus taeda*). *Plant Reproduction* 27:69–78.

Quinn CR, Iriyama R, Fernando DD. Computational Predictions and Expression Patterns of Conserved MicroRNAs in Loblolly Pine (*Pinus taeda*). Resubmitted to *Tree Genetics and Genome* (minor revision).

Kapuscinski K, Farrell J, Stehman S, Teece M, Boyer G, Fernando D and Tschaplinski T. Selective Herbivory by an Invasive Cyprinid, the Rudd *Scardinius erythrophthalmus*. Resubmitted to *Freshwater Biology*.

B. Non-refereed Publications

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

Potrikus J, Bouchard J, Young S and Fernando D. Poster Presentation: Ecological impact assessment of the proliferative growth of hardy kiwi in the Connecticut, Massachusetts, and New York tri-state area of the United States. Hudson River Symposium: Watershed Linkages in a Changed World, SUNY New Paltz, May 2014.

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

EFB Graduate Programs: Admission Requirements and Application Tips. Invited presentation for the graduating biology students from SUNY Oswego, March 31, 2014.

**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.

**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.)

Campbell’s Biology, 10<sup>th</sup> Ed. Chapter 38 – Invited Reviewer

1

b. Reviewer

Journal(s)

No. of manuscripts

American Journal of Botany

1

Tree Genetics and Genomics

1

PLOS ONE

1

| <u>Agency</u> | <u>No. of proposals</u> |
|---------------|-------------------------|
| NSF           | 10                      |
| <u>Other</u>  |                         |

c. Participation (workshops, symposia, etc.)

| <u>Name of workshop, etc.</u> | <u>Date</u> | <u>Place</u> |
|-------------------------------|-------------|--------------|
|-------------------------------|-------------|--------------|

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

Sabbatical Leave (Fall 2013) to continue writing chapters for book project entitled “Sexual Reproduction in Forest Trees” through Cambridge University Press.

D. Foreign Travel (Where, When, Purpose)

**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

B. College-level

Member, Graduate Council

C. University-wide, including Research Foundation

None

**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 (mostly for Spring 2014), I taught EFB 326 (Diversity of Plants), BTC 497 (Research Design and Professional Development), EFB 495 (Undergraduate Experience in College Teaching) and EFB 498 (Independent Research in Environmental Biology), and in total, 78 undergraduates have been served through this capacity. In addition to the formal interactions with the students during lectures, I also interacted with many of them during the labs and/or out of the lecture periods through involvement in some of the lab activities and/or writing assignments. Many of the students also came in during my office hours for clarifications/short questions or

conversations on various topics including practical applications of concepts covered in the lectures. I have trained several undergraduate students in my lab through independent research and internship, presented invited lectures to other courses (in ESF and SUNY Oswego). I have 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 the required forms, and shifting from one major or degree program to another. I have worked with my two M.S. graduate students on various aspects of the laboratory and/or field components of their research projects, draft manuscripts, grant/fellowship applications, and poster presentations. I have also worked with and trained the two graduate students who both taught the lab portions of my course (Plant Diversity) for the first time. In total, at least 82 students have been served under various capacities.

For the department/college: I served as EFB's Graduate Director for the seventh year (except while on sabbatical leave for fall 2013) 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 the EFB graduate program (through email, phone, and/or personal appearances) from several potential applicants and current graduate students; 4) processed a total of 113 (to date) for fall 2014 entrance 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; and 5) provided informal orientation to some new graduate students regarding EFB graduate program and new faculty about the graduate application and review procedures. I also worked with the EFB Graduate Secretary 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. As a member of EFB's Graduate Program Academic Committee, 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 fourth Master of Science student – Jessica R. Bouchard (Fall 2011 to Fall 2013); 2) Successful completion of a Master of Professional Student (co-mp with Dr. Robin Kimmerer) – Stephanie Smith (Spring 2012-Fall 2013); 3) Funding of my research proposal on “Reproductive, genetic and ecological assessment of the invasive potential of hardy kiwi in the northeast U.S.”; 4) Recruitment of an Master of Science student (Jennifer Potrikus) to work on the hardy kiwi project; 5) Publication of two papers – an invited review for *New Forests* (The Pine Reproductive Process in Temperate and Tropical Regions) and co-authors with my graduate students - Quinn CR, Iriyama R, Fernando DD. 2014, on Expression Patterns of Conserved MicroRNAs in the Male Gametophyte of Loblolly Pine (*Pinus taeda*), *Plant Reproduction* 27:69–78; 6) Invited as Panel Review Member for NSF's Plants, Fungi and Microbial Evolution and Developmental Mechanisms; and 7) As my primary Sabbatical project – I have written my parts on the three additional chapters plus revisions of the previous eight chapters including the sections on References and Figures and Tables. Overall, 11 chapters have been written and one more remaining to be completed (12 Chapters in all) for the textbook (Sexual Reproduction in Forest Trees) that I am co-authoring with Dr. John N Owens through a contract with the Cambridge University Press.

In spite of the above, this academic year has been very challenging to me due the significant barriers to optimum working conditions in Illick Hall. I am referring to the severe dust and noise from construction projects, limited access to my own labs, office and other essential facilities (including the lack of greenhouse space for both research and teaching), power shut downs, almost constant breaking down of growth rooms that have ruined many experiments to say the least, construction personnel showing up unannounced on offices and labs to check on things that they needed to work on, and etc. All these have caused reduction in my own and my graduate students' current productivity. Unfortunately, most of these work disruptions will have ripple effects on my research program and even health. I hope that our administrators are paying attention to this.

**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 2014

a. Course(s) to be offered

b. Proposed research activity

Conduct field and lab work related to hardy kiwi and American hart's-tongue fern projects

Continue working on textbook project

Write up papers for publication re: secretory proteins and AHTF

c. University, professional society, and public service

2. Fall Semester 2014

a. Course(s) to be offered

Same as before

b. Proposed research activity

Conduct field and lab work related to hardy kiwi and American hart's-tongue fern projects

Continue working on textbook project

c. University, Professional society, and public service

NSF Panel Reviewer for October 2014

3. Spring Semester 2015

a. Course(s) to be offered

Same as before

b. Proposed research activity

Conduct field and lab work related to hardy kiwi and American hart's-tongue fern projects

c. University, professional society, and public service