

ANNUAL REPORT: June 1, 2012 – May 31, 2013
(i.e., Summer 2012, AY 2012-2013)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: Martin Dovčiak

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

	Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
FALL:	EFB 535	Flowering Plants: Div., Evol., Syst.	3	16	1
SPRING:	EFB 445	Plant Ecology & Global Change	3	39	-
	EFB 645	Plant Ecology & Global Change	3	15	-

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)

Course No.	Title	Credit Hrs.	No. Students
ESF 499	Honors Thesis/Project	3	1
EFB 298	Research Internship/Env. Biol.	2	1
EFB 498	Independent Research/Env. Biol.	3	1
EFB 797	Ecolunch Seminar	1	1
EFB 798	Research Problems/EFB	9	3
EFB 898	Professional Experience	6	1
EFB 899	Masters Thesis Research	5	2
EFB 999	Doctoral Thesis Research	10	2

3. Continuing Education and Extension (short courses, workshops, etc.) —None.

4. Guest Lecture Activities

Course No.	Title	No. of Lectures
EFB 210	Diversity of Life I	3
EFB 326	Diversity of Plants	1

II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor 21 and unofficial advisor 5
- 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

Completed students:

1. Keith Cardinali, M.P.S., August 2012.
Capstone Project: Enhancement and stabilization of a stormwater retention basin, Salina, New York.

In Progress:

2. Juan Carlos Álvarez-Yépez, Ph.D., since August 2008 (Ph.D. Candidate since May 2011).
3. Jay Ward Wason, III., Ph.D., since August 2011.
4. Stephen Langdon, M.S., since August 2010.

CO-MAJOR PROFESSOR

In Progress:

5. Juliana Quant, M.S., since August 2009 (with D. Leopold).
6. Monica B. Berdugo Moreno, Ph.D., since August 2012 (with R. Kimmerer)

MEMBER, STEERING COMMITTEE (other than those listed above)

1. Mason Heberling (Ph.D., Syracuse University, J. Fridley)
2. Andrew Siefert (Ph.D., Syracuse University, M. Ritchie)
3. Patrick Raney (Ph.D., D. Leopold)
4. Jon Cale (Ph.D., J. Castello)
5. Scott Sveiven (M.S., D. Leopold)
6. Bettyjo Jivoff (M.S., D. Leopold)
7. Frances Jean More Delaney (M.S., D. Leopold)
8. Thomas Ray Brumbelow (M.S., D. Leopold)
9. James Johnson (M.S., D. Leopold)
10. Laurel Nowak-Boyd (M.S., J. Cohen)

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

1. Meredith Kane (M.S. defense, examiner)
2. Jennifer Gillrich (M.S. defense, examiner)
3. Jeremy Discenza (M.S. defense, examiner)
4. Xiaole Ni (Ph.D. candidacy exam, chair)

III. RESEARCH COMPLETED OR UNDERWAY

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

- National Park Service. "Appalachian Trail MEGA-Transect Study". G. Lawrence, D.A. Burns, K.C. Rice, SW Bailey, R. Minocha, M. Dovčiak, D. Leopold, S. Sullivan, K.C. Weathers, A.C. Ellsworth. \$747,242; 5/2010-12/2013 (\$49,310 supported J. Quant, but current year budget to SUNY/ESF is \$0). 5% time spent.

- 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)
- Electric Power Research Institute. “Cost effectiveness of cleaning techniques for controlling human-based transport of invasive exotic plants on electric transmission line rights-of-way across New York”. C. Nowak and M. Dovčiak. \$414,551 (award to Dovčiak: \$176,184), 8/2012-8/2015 (J. Quant, C. Peck, supported MS students).
 - Northeastern States Research Cooperative. “Global change fingerprints in montane boreal forests: Implications for biodiversity and management of the northeastern protected areas”. M. Dovčiak, C. Beier, G. Lawrence, J. Battles. \$89,497. 8/2012-8/2014 (J. Wason, supported PhD student).
 - USDA CSREES/McIntire-Stennis. “Forest change in the Adirondacks over 40 years”. M. Dovčiak, J. Im, C. Beier. \$25,563. 8/2011-9/2012 (J. Wason, supported PhD student).
 - CONACYT. “Global ecotones under climate change: developing a general theory of climate-vegetation interactions across tropical, temperate, and boreal ecotones”. M. Dovčiak, G. Williams-Linera, J.C. Álvarez-Yépiz, \$5,250; 1/2012-12/2012.
 - Picker Interdisciplinary Science Institute, Colgate University. “Whole-ecosystem restoration through liming of acidified tributary streams in the Honnedaga lake basin in the Adirondack Mountains”. R. Fuller, D. Josephson, C. Kraft, C. Beier, G. Lawrence, B. Baldigo, C. Beier, M. Dovčiak. \$70,000. 2012–2013.
 - Northeastern States Research Cooperative. “Impacts of acidic deposition and soil calcium depletion on terrestrial biodiversity and food webs in Northern hardwood forest ecosystems”. C. Beier, M. Mitchell, J. Gibbs, M. Dovčiak, M. Fierke. \$144,488. 8/2010–10/2012 (C. Bondi, supported PhD student).
 - USDA CSREES/McIntire-Stennis. “Coupling local-scale climate change and forest ecosystems”. C. Beier and M. Dovčiak. \$81,271. 2010-2012 (D. Bishop, supported MS student).
2. Research Proposals pending (include information as in B.1., above).
- NYS DEC. “Evaluating deer impacts on forests of New York State”. M. Dovčiak, J. Frair, J. Hurst \$174,724. 2013-2014 (support for a post-doctoral scientist).
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

Published:

- Wiezik M, Svitok M, Wiezikova A, Dovčiak M. 2013. Shrub encroachment alters composition and diversity of ant communities in abandoned grasslands of western Carpathians. *Biodiversity and Conservation*. DOI 10.1007/s10531-013-0446-z, in press.
- Frelich LE, Peterson RO, Dovčiak M, Reich PB, Vucetich JA, Eisenhauer N. 2012. Trophic cascades, invasive species, and body-size hierarchies interactively modulate climate change responses of ecotonal temperate-boreal forest. *Philosophical Transactions of the Royal Society B*, 367: 2955-2961.
- Halpern CB, Halaj J, Evans SA, Dovčiak M. 2012. Level and pattern of overstory retention interact to shape long-term responses of understories to timber harvest. *Ecological Applications*, 22: 2049–2064.
- Beier CM, Stella JA, Dovčiak M, McNulty SA. 2012. Local climatic drivers of changes in phenology at a boreal-temperate ecotone in Eastern North America. *Climatic Change* 115: 399-417.
- Beier CM, Woods AM, Hotopp KP, Gibbs JP, Mitchell MJ, Dovčiak M, Leopold DJ, Lawrence GB, Page BD. 2012. Changes in faunal and vegetation communities along a soil calcium gradient in northern hardwood forests. *Canadian Journal of Forest Research* 42: 1141–1152.

Submitted/in revision:

- Osborne P, Dovčiak M, Gibbs JP, Patrick DA. Prescribed fire conserves the eastern massasauga rattlesnake, *Sistrurus c. catenatus*, by creating diverse early-successional habitat. *Endangered Species Research*, (in revision).
- Álvarez-Yépiz JC, Búrquez A, Dovčiak M. Ontogenetic shifts in plant-plant interactions in a rare ancient cycad within angiosperm communities. *Oecologia*, (submitted).
- Westerband A, Dovčiak M. Aspect influences soil moisture and species coexistence in semi-arid pinyon-juniper woodlands of the southwestern United States. *Journal of Arid Environments*, (submitted).

B. Non-refereed Publications—None.

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

- Álvarez-Yépiz JC, Búrquez A, Dovčiak M. 2012. Coexistence mediated by ontogenetic shifts in plant-plant interactions: Insights from a rare cycad within angiosperm communities. Ecological Society of America, Annual Meeting, Portland, OR. Aug. 5-10, 2012.
- Halpern CB, Halaj J, Evans S, Dovčiak M. 2012. Level and pattern of overstory retention interact to shape long-term responses of understories to timber harvest. Ecological Society of America, Annual Meeting, Portland, OR. Aug. 5-10, 2012.
- Frelich LE, Peterson R, Dovčiak M, Reich P, Vucetich J, Eisenhauer N. 2012. Trophic cascades and the temperate-boreal transition in a warming climate. Impact of Ungulates and Other Mammalian Herbivores on Forest Ecosystems—A workshop of Forest Ungulates Research Network (FURN) and the SNS/EFINORD networks Natural Disturbance and PRIFOR, in Järvelja Forest Station, Estonian University of Life Sciences, Estonia, Oct. 8-12, 2012.

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

- Tecumseh Elementary School (April 12, 2013). Presentation to ~ 40 second graders and their teachers about ecology and botany and what it means to be an ecologist or botanist.

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local)—None.
2. Industrial and Commercial Groups, etc.—None.

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

- National Science Foundation Grant Application Reviewer
- Consulting for wetland monitoring at a Shingle Shanty Preserve and Research Station in the Adirondacks, NY.
- Responding to various inquiries from the public (e.g., Global Student Embassy, Syracuse Botanical Club).

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)—None.

B. 1. Activities in Professional Organizations (offices held, service as chairman, member, participant or consultant)

- Appalachian Trail Mega-Transect Research Consortium (member)
- Mountain Research Initiative Expert Database (member)

- H.J. Andrews Experimental Forest LTER Program, OR (collaborator)
- Demonstration of Ecosystem Management Options (DEMO) Study (collaborator)

2. Professional Society Membership

- Ecological Society of America

3. Other Professional Activities

- Editorial activity—None.
- Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Forest Ecology and Management	1
Journal of Vegetation Management	1
Northeastern Naturalist	1
Plant Ecology	1

<u>Agency</u>	<u>No. of proposals</u>
NSF- Earth Sciences	1

Other

- Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
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- Northeast Deer Technical Committee, Deer-Forest Impacts Sub-Committee, Annual Northeast Fish and Wildlife Conference, 4/10/2013, Saratoga Springs, NY.
- Deer-forest impacts meeting, Cornell Cooperative Extension, 2/20/2013, Ithaca, NY.

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

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|--|----------|--------------------------|
| • NRCS Conservation Innovation Grants Webinar | 3/7/2013 | Washington, DC (webinar) |
| • Hardy L. Shirley Faculty Mentoring Colloquium, | 1/8/2013 | Syracuse |

D. Foreign Travel (Where, When, Purpose)

- Technical University in Zvolen, Slovakia (Aug. 4-18, 2012). Research on the mechanisms and consequences of woody colonization of grasslands in the Carpathian Mountains.

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

- Chair, Committee for Robert Burgess Graduate Scholarship in Ecology.
- Graduate Program Advisory Committee, member (till 2/2013).

B. College-level

- ESF Undergraduate Honors and CSTEP programs, mentor to four undergraduate students.
- Graduate Program in Environmental Science–Ecosystem Restoration, member
- Graduate Program in Environmental Science–Environmental Monitoring and Modeling, member
- Beech Working Group, member
- Center for Urban Environment, member
- Regular participant in ESF winter and spring Convocations

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.

Students: This year I taught Plant Ecology and Global Change (EFB 445/645) to the highest enrolment since I taught this class at ESF (54 students), and I taught Flowering Plants: Diversity, Evolution, and Systematics (EFB 535) to the second highest enrollment in this class since I started to teach it at ESF (16 students). I received some of my best teaching evaluations in the end-of-course surveys for EFB 535—compared to my long term average (4.5), my score in 2012 was 4.6, and 4.8 for the instructor knowledge, enthusiasm, and effectiveness (course evaluations for my Spring EFB 445/645 are not available yet, but likely to be >4 as in the past years). I continued to support our departmental series, EFB 210-Diversity of Life I, by contributing three lectures, and to contribute by a guest lecture to EFB 326-Diversity of Plants. I advised 21 undergraduates in Environmental and Conservation Biology majors, and 5 students in total in the Honors, NSF-UMEB, and CSTEP programs. I served as an MP or co-MP to 6 graduate students (3 Ph.D., 2 M.S., 1 M.P.S.) and completed the M.P.S. student (who is now gainfully employed as an environmental biologist). I served on steering committees for another 10 graduate students (including two at Syracuse University), and on additional 4 graduate exam/defense committees. All of my 5 completed graduate students and several undergraduate researches continue to be successful, with professional positions at universities or in environmental consulting firms such as Jones Ecological Research Center, University of Arizona, University of Miami, or O'Brian & Gere.

Department/College: At the departmental level, I continued to serve as the Chair for the Selection Committee for the Burgess Graduate Scholarship in Ecology, a member of the Graduate Program Advisory Committee, faculty mentor in UMEB program, and by participating (informally) as much as possible in the departmental faculty searches (wildlife, toxicology, systems ecology) and other departmental events and meetings. At the college level, I served as a faculty mentor in the Honors and CSTEP programs, a member in two of the GPES Areas (Ecosystem Restoration, Environmental Monitoring and Modeling) and I contributed significantly to the program of visiting speakers Drs. Battles and Cogbill by organizing lab group meetings/lunch appointments. I continued to be as a core faculty member in the Center for Urban Environment, a founding member of ESF Beech working group, and a regular participant in ESF winter and spring Convocations. I continued to represent College/Department in my broader professional service, which included serving as a reviewer for NSF-Earth Sciences Program (1 proposal) and for four journals significant for my field (*Forest Ecology and Management*, *Journal of Vegetation Science*, *Plant Ecology*, and *Northeastern Naturalist*), as well as by my involvement as a co-PI or collaborator in larger research groups such as the Appalachian Trail Mega-Transect Study group, vegetation group in H.J. Andrews Experimental Forest LTER Program and DEMO Study. I informally represented college as a guest speaker at Tecumseh Elementary School where I talked to ~ 40 second graders and their teachers about ecology and botany and what it means to be an ecologist or botanist.

Self/Professional Development: As a lead PI, I continued studies of climate-vegetation gradients and climate change effects on coniferous-deciduous ecotone and on mountain spruce-fir forests in the Adirondacks and across northeastern US (NY, VT, NH, ME)—funded by McIntire-Stennis program, NSRC, and CONACYT (\$120,310 in total). I also started a new 3-year collaborative study with Dr. Nowak (FNRM) to investigate the effects of cleaning techniques on the spread of invasive plants in New York's power-line corridors—funded by EPRI (\$414,551 total award, with \$176,184 sub-award to me). In addition, I wrote a new research proposal on the effects of deer herbivory on forest regeneration in New York state (\$174,724), slated for funding by the NYS DEC; co-PIs: Frair and Hurst). I continue to serve as a CoPI on the NPS-funded, multi-investigator Appalachian Trail MEGA-Transect Study (\$747,242). This past year, I co-authored 5 papers (all published) on various aspects of global change effects on forest ecosystems in *Ecological Applications*, *Philosophical Transactions of the Royal Society B*, *Biodiversity and Conservation*, *Climatic Change*, and *Canadian Journal of Forest Research* (impact factors ranging from 1.7 to 6.4), and also 3 additional manuscripts submitted for review. As one of three speakers, I was invited to present my work in the Demonstration of Ecosystem Management Options (DEMO) Study at a symposium organized by Canadian Botanical Association at their annual meeting in British Columbia (pending, June 1-5, 2013). I co-authored tree presentations given at an annual meeting of the Ecological Society of America and an international workshop on the impacts of herbivores on forest ecosystems (held in Estonia) and I presented my research proposal on the deer impacts on forests in New York State to collaborators at the Cornell Cooperative Extension and at the Annual Northeast Fish and Wildlife Conference in Saratoga Springs. My summer travel to Slovakia continued to enhance my research on woody colonization of grasslands (e.g., 2013 paper in press in *Biodiversity and Conservation*).

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)

My main plans include: (1) authoring additional manuscripts as the first author based on my global change ecology work in forest ecosystems, (2) making sure that manuscripts of my recent and current graduate students are (re) submitted, (3) graduating three of my current 5 graduate students, (4) submitting proposals for research funding to support continuation of my current work on climate-vegetation relationships and to locate additional funding for the beginning deer-forest impacts studies, (5) conclude the Appalachian Trail MEGA-Transect study, (6) continue NSRC study of climate-vegetation relationships and climate change effects on northeastern forests, (7) continue EPRI study of cleaning methods and invasive plant spread in power-line corridors, (8) continue teaching and develop my main courses *Plant Ecology and Global Change* (EFB 445/645), *Flowering Plants: Diversity, Evolution, and Systematics* (EFB 435/635), and offer a graduate seminar, (9) continue contributing to *Diversity of Life I* (EFB 210), and (10) continue committee and public service and guest lectures as appropriate.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2013

a. Course(s) to be offered– None.

b. Proposed research activity

- Coordinate field work for the vegetation-climate NSRC study in northeastern US and greenhouse work for the ERPI study of the cleaning techniques impacts on plant invasions in New York power-line corridors.
- Draft final report for the vegetation components of the AT MEGA-transect study.
- Revise and resubmit completed manuscripts as appropriate, at least one as the first author (based on NSRC or EPRI studies).
- Prepare at least one proposal for funding for NSF/USDA to expand my current NSRC work on elevational vegetation-climate gradients.
- Travel to the Annual Meeting of Canadian Botanical Association to present an invited seminar and to participate in the teaching methods in botany as well as research portion of the conference.

c. University, professional society, and public service
Committee service as appropriate.

2. Fall Semester 2013

a. Course(s) to be offered

- *Flowering Plants: Diversity, Evolution, and Systematics* (EFB 435/635- new course numbers)
- Flowering plants sections in *Diversity of Life I* (EFB 210)

b. Proposed research activity

- Final report and associated manuscript(s) for the AT MEGA-transect study
- Continue NSRC and EPRI studies (data management, analyses, manuscript preparation)
- Prepare and submit at least one additional (pre)proposal to NYSEDA/USDA/NSF competitions to link/extend the current NSRC grant, AT-mega-transect study, and deer-forest impacts proposal.
- Recruit the post-doc for the deer-forest impacts study.

c. University, Professional society, and public service

Continue current service in College-wide commitments—GPES, CSTEP, CUE, and Beech Working Group, as well as departmental commitments such as chairing the Burgess Scholarship in Ecology. Other service as appropriate.

3. Spring Semester 2014

a. Course(s) to be offered

- *Plant Ecology and Global Change* (EFB 445/645)
- Graduate seminar in *Global Change in Forest Ecosystems* (EFB 797)

b. Proposed research activity

- Complete data development and processing stage for the deer-forest impacts study and begin working more intensively with Cornell extension to develop the extension component.
- Prepare NSRC and EPRI field/greenhouse work (year 2 for both studies).
- Prepare and submit a full proposal to NSF if invited.
- Prepare and submit additional manuscripts from year 1 of NSRC and EPRI studies.

c. University, professional society, and public service

Continue current service in College-wide commitments—GPES, CSTEP, CUE, and Beech Working Group, as well as departmental commitments such as chairing the Burgess Scholarship in Ecology. Other service as appropriate.