



Sub-Antarctic Biocultural Conservation Program
University of North Texas & Universidad de Magallanes

www.chile.unt.edu, www.umag.cl/williams, & www.ieb-chile.cl/itser

**Field Biocultural Conservation (FBC) UMAG-IEB course &
Tracing Darwin's Path-UNT course**

2011- 2012 Schedule of Activities, Program & Syllabus

Core Professors:

Dr. Jaime Jiménez, *wildlife ecologist*, UNT-UMAG

Dr. James Kennedy, *stream ecologist*, UNT-UMAG

Dr. Ricardo Rozzi, *conservation philosopher*, UNT-UMAG-IEB

Assistant Professors

Dr. Ronnie Reyes, *wildlife ecologist*, UMAG

Dr. Tamara Contador, *stream ecologist*, UNT

Invited Faculty – Researchers:

Dr. William Buck, *bryologist*, New York Botanical Garden, Bronx-NY, USA

Dr. Laura Briscoe, *bryologist*, New York Botanical Garden, Bronx-NY, USA

Dr. Melinda Coogan, *stream ecologist*, Buena Vista University, Iowa, USA

Dr. Ricardo Garilleti, *bryologist*, Universidad de Valencia, Spain

Dr. Leopoldo Sancho, *lichenologist*, Universidad Complutense de Madrid, Spain

Course Assistants:

Cristian Celis, *veterinarian*, IEB

Michelle Chauveau, *biologist*, UMAG

Álvaro Núñez, *IEB Omora Park*

Camila Valladares, IEB

Kelli Moses, *biologist*, UNT *coordinator*

Omora Staff:

Paula Caballero, IEB

Oscar Celis, *lawyer*, Friend of Omora

Carla Oyarzo, *education*, UMAG

Viviana Bauk, *IEB Omora Park coordinator*

Yanet Medina, UMAG-IEB

Course Catalogue Information: PHIL 4960/6781 and BIOL 4005/5054

Academic Dishonesty Policy: Students are responsible for reading, understanding, and knowing UNT's Academic Dishonesty Policy that can be found at: http://www.vpaa.unt.edu/academic_integrity.htm. Academic dishonesty in this class is unacceptable and will not be tolerated in any form.

Disability Accommodation: Statement: The University of North Texas is on record as being committed to both the spirit and the letter of federal equal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

Drop/Withdrawal Information: Drop/Withdrawal Information, and other important Academic Dates can be found at www.essc.unt.edu/registrar/schedule/scheduleclass.html

COURSE DESCRIPTION:

Overview- The Field Biocultural Conservation and TDP courses will be held between December 27th, 2011 and January 14th, 2012. Students participating in both courses will be involved in the same activities throughout the duration of the courses. These activities involve preparatory tasks prior to the course, and also post-course activities. Continued analysis of data for those interested. Furthermore, this course will provide students with an interdisciplinary research, conservation and education experience at one of the most pristine wilderness areas remaining in the world. The course will explore ways of defining, studying, communicating and conserving biocultural diversity. These goals will be achieved by exposing students to a first-hand experience using the case study of the creation and implementation of the Omora Park as a long-term ecological study site that serves to *link society and development with biodiversity, history and ecosystems* in the Cape Horn Biosphere Reserve.

Research topics of the FBC-TDP 2011-2012 course: The general topic of this course will be the study of the diet of birds inhabiting sub-Antarctic forests at Omora Ethnobotanical Park (OEP), Navarino Island, Cape Horn Biosphere Reserve (55°). This study also includes research on bird ecological interactions with plants and invertebrates. The course will be divided in 2 groups, which will alternate activities in the field and laboratory according to assigned tasks.

The specific ornithological questions that students will investigate during this course are part of a long-term monitoring program at OEP and include:

A) How long do birds live?

Methodology: To help answer this question, the course will conduct mistnetting and banding of birds at OEP. Students will go to the field in the morning to open mistnets and collect data. During the afternoons, students will focus on entering data and analyzing samples in the laboratory. Please refer to the end of this document for a specific schedule of activities.

B) What do birds eat?

Methodology: Students will study the diet of birds by examining bird feces of birds captured in the mist nets. When a bird is captured, it defecates on the hand or bag that is used to keep the bird in the field. Students will collect feces with a spatula and will place them on a paper envelope. The collector will write the date, net number (habitat), species, ring number, and name or initials of who collects the feces. Later, the contents of the envelope will be placed on a petri dish and will be analyzed with a stereoscope. Samples will be then compared with a seed and invertebrate reference collection.

- Seed and invertebrate references are prepared in the following way:

- **Seeds** are extracted from fruits (i.e. calafate, michay, canelo, leñadura, chaura, murtilla, notro, gramíneas, etc), cleaned and glued to a thick cardboard or wood and are classified to species.

- **Invertebrates** are classified to order level (i.e. Coleoptera, Hemiptera, Lepidoptera, etc). Cristian Celis and Tamara Contador will prepare references during early November.

C) What food is available for birds?

Methodology: Students will study food availability for birds by collecting available seeds and insects in a determined area adjacent to the mistnets at OEP during the mistnetting period.

Students will collect insects and seeds from available fruits.

- **Seed and invertebrate are collected in the following way:**

- **Seeds** are extracted from fruits (i.e. calafate, canelo, leñadura, chaura, murtilla, notro, gramíneas, etc), cleaned and observed under the stereoscope to be classified to species. When collecting, the collector will write the date, habitat, species, and name or initials of who collects the seeds. Samples will be then compared qualitatively with a seed and invertebrate reference collection. Areas of sampling will be determined in the field, during site recognition.
- **Invertebrates** are collected using the following techniques: a) pitfall trap, b) aerial net, c) modified pitfall for insects living on trees, d) light traps. When collected, insects will be carried to the laboratory and will be classified to order level (i.e. Coleoptera, Hemiptera, Lepidoptera, etc). Areas of sampling will be determined in the field, during site recognition.

Finally, the ornithological work might involve guided visits to tourists, authorities or other visitors to Omora Park during the period of the course, to show them the ongoing research. It is emphasized that ecotourism is considered as a tool for biocultural conservation.

This UNT Study Abroad Course is taught as part of the Sub-Antarctic Biocultural Conservation Program (www.chile.unt.edu) in partnership with a masters-level class in conservation at the University of Magallanes (UMAG), Chile and is also part of the Chilean Long-Term Socio-Ecological Research Network's program of field courses, coordinated by the Institute of Ecology and Biodiversity (IEB, www.ieb-chile.cl).

Grading

1) *Essays (10%)*

Each student will select one of the class topics (see above) and using the readings develop a 5-10 page (12 font, double spaced) essay summarizing that theme of the course. Essays will be collected on Dec 28th.

2) *Comparison and Description of Avian Inhabitants/Habitats/Habits of Cape Horn and Texas (10%)*

Each participant should use the provided list of birds to do a complete worksheet and add pictures and descriptions of each species regarding its morphological characteristics, habitat requirements, behavior, diet or other relevant habits and information. This exercise will help you prepare by way of comparison and analogy to understand new organisms based on their relationship, similarities and differences to other species you know. The completed list will be collected on Dec 28th.

3) *Natural History / Art Journal (30%)*

When reading Charles Darwin's journal *Voyage of the Beagle* about his 5 year trip around the world, it is striking the way he blends scientific observation with reflections about the broader implications, context and surroundings (including cultures) he was encountering. Other examples include Lewis and Clark's writings about the American West. We would like to "trace Darwin's path" and ask each student to keep a journal of the day's reading, reflections, activities and achievements. Entries should consist of reflections on the assigned readings and/or activities and observations made during field activities.

Ideally field notes will be made using a waterproof pen (or pencil) in a journal with waterproof paper (such as Rite in the Rain, All-Weather Journal). However, other notebooks can be used but they must be bound and should be protected in a sealable plastic bag. Maximum size for the field notebook should be approximately 8.5" x 11" when two pages are open. This size will enable the journal to be xeroxed conveniently and also to carry in the field, which will be necessary, since recordings in journals are meant to be done on the day of the activities. In addition, an art notebook (can be the same notebook as above) will be needed with the same dimensions, but ensuring a hard cover and 180 to 240 weight paper that allows for water colors. Other art materials will be provided in Chile. Student journals will be checked randomly throughout the course. Suggestions will be made on improving the quality of the journal format. It will be expected that journal entries are, as reasonably as possible, kept up to date, legible and well organized. This document will be key to keep your valuable records, thoughts and experiences while in the field and may serve for your future purposes. *At the end of the class journals will be collected, and may be copied before being returned to the student.*

4) Guided Field Activities (20%)

The course participants will conduct a guided tour for scientists and authorities visiting the Omora Park. The goal of these "tours" is for students to learn the Omora Park's existing trail systems and interpretive content, as well as synthesize their own experiences into the narrative. As much as possible, the work groups will be structured to represent a cross section of academic interests of the course participants.

5) Participation & Presentation of Research Results (30%)

Student responsibilities are to prepare ahead of time, attend all the discussion sessions, field exercises, ask questions, and express themselves creatively and concisely in their work. Ways of earning points for participation include contributing positively to class discussion of readings and participate in field exercises. Contributing positively requires having read, and as thoroughly as possible understood, the assigned readings and at least being able to raise important questions if not providing definitive answers. Students will also prepare a power point presentation after samples have been analyzed in order to present preliminary results. This presentation will be carried out during Jan 11th at the Field Station.

Required Reading List

- Contador, T. 2011. Chapter 5 “Applying field environmental philosophy at the Omora Ethnobotanical park: aquatic invertebrates of the southernmost watersheds,” in Ph.D dissertation “Benthic Macroinvertebrates of Temperate, Sub-Antarctic Streams: The Effects of Altitudinal Zoning and Temperature on the Phenology of Aquatic Insects Associated to the Robalo River, Navarino Island (55°S), Chile.
- Elphick, C.S., J.E. Jimenez, R. Reyes & R. Rozzi. 2011. Seasonal dynamics of the Subantarctic bird community in different habitats of the Cape Horn Biosphere Reserve. Introduction to Chapter 2, pp. XX-XX, in Rozzi, R. & J.E. Jiménez (eds.), *Ornitología Subantártica Magallánica*, Primera Década de Estudios de Aves del Parque Etnobotánica Omora, Reserva de Biosfera Cabo de Hornos, Chile. *In preparation*.
- Goffinet, B., R. Rozzi, L. Lewis, W. Buck & F. Massardo. 2012. *Ecotourism with a Hand Lens in the Miniature Forests of Cape Horn*. UNT Press – Ediciones Universidad de Magallanes.
- Ippi, S., C. Anderson, R. Rozzi & C. Elphick. 2009. Annual variation of abundance and composition in forest bird assemblages on Navarino Island, Cape Horn Biosphere Reserve, Chile. *Ornitología Neotropical* 20: 231-245.
- Maffi, L. (ed.) 2001. *On Biocultural Diversity: Linking Language, Knowledge, and the Environment*, Smithsonian Institution Press.
- Moorman, M.C., C.B. Anderson, Á.G. Gutiérrez, R. Charlin & R. Rozzi. 2006. Watershed conservation and aquatic benthic Macroinvertebrate diversity in the Alberto D’Agostini National Park, Tierra del Fuego, Chile 34: 41-58.
- Rozzi, R., F. Massardo, C. Anderson, K. Heidinger & J.A. Silander, Jr. 2006. Ten principles for biocultural conservation at the southern tip of the Americas: the approach of the Omora Ethnobotanical Park. *Ecology and Society* 11: 43. [online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art43/>
- Rozzi, R., J. Armesto, B. Goffinet, W. Buck, F. Massardo, J. Silander, M. Kalin-Arroyo, S. Russell, C.B. Anderson, L. Cavieres & J.B. Callicott. 2008a. Changing biodiversity conservation lenses: insights from the sub-Antarctic non-vascular flora of southern South America. *Frontiers in Ecology and the Environment* 6: 131-137.
- Rozzi, R., X. Arango, F. Massardo, C. Anderson, K. Heidinger & K. Moses. 2008b. Field Environmental Philosophy and Biocultural Conservation: The Omora Ethnobotanical Park Educational Program. *Environmental Ethics* 30: 325-336.
- Rozzi, R., C.B. Anderson, J.C. Pizarro, F. Massardo, Y. Medina, A. Mansilla, J.H. Kennedy, J. Ojeda, T. Contador, V. Morales, K. Moses, A. Poole, J.J. Armesto & M.T. Kalin. 2010. Field environmental philosophy and biocultural conservation at the Omora Ethnobotanical Park: Methodological approaches to broaden the ways of integrating the social component (“S”) in Long-Term Socio-Ecological Research (LTSER) sites. *Revista Chilena de Historia Natural* 83:1-5, 25-27. [supplementary materials].
- Rozzi, R., F. Massardo, C. Anderson, S. McGehee, G. Clark, G. Egli, E. Ramilo, U. Calderón, C. Calderón, L. Aillapan & C. Zárraga. 2010. *Multi-Ethnic Bird Guide of the Sub-Antarctic Forests of South America*. UNT Press – Ediciones Universidad de Magallanes, Denton TX and Punta Arenas, Chile.
- Rozzi, R., J. Armesto, J. Gutierrez, C. Anderson, F. Massardo, G. Likens, A. Poole, K. Moses, E. Hargrove, A. Mansilla, J. Kennedy, M. Willson, K. Jax, C. Jones, J.B. Callicott & M. Arroyo. Integrating ecology and environmental ethics: Earth stewardship in the southern end of the Americas. *BioScience*. *Accepted*.
- Vuilleumier, F. 1985. Forest birds of Patagonia: Ecological geography, speciation, endemism and faunal history. *Ornithological Monographs* 36: 255-304.

Supplementary Reading Lists: TBA

SPECIFIC SCHEDULE OF ACTIVITIES

Group	Date	Task	Place	Time
UMAG-IEB, UNT	12/28/11	Habitat recognition of study site. Visit of Omora Park	Omora Park	15:00-18:00
UMAG-IEB, UNT	12/28/11	Introduction to bird banding	Omora Park	20:00-21:00
UMAG-IEB, UNT	12/29/11	Bird mist netting and feces collection. Lunch at Omora Park.	Omora Park	7:00- 19:00
UMAG-IEB, UNT	12/29/11	Insect and seed collection (food availability)	Omora Park	13:30- 18:00
UMAG-IEB, UNT	12/30/11	Bird mist netting and feces collection. Lunch at Omora Park.	Omora Park	7:00- 19:00
UMAG-IEB, UNT	12/31/11	Bird mist netting and feces collection. Lunch at Omora Park.	Omora Park	7:00- 12:00
UMAG-IEB, UNT	12/31/11	Identification and count of insects and seeds in the laboratory. Data entry	Field station	14:00- 17:00
UMAG-IEB, UNT	12/31/11	New Year's Party in Pto. Williams	Field station	To be determined
UMAG-IEB, UNT	1/1/12	Cerro Bandera trail, optative	Omora Park	9:00- 12:00
UMAG-IEB, UNT	1/1/12	Identification and count of insects and seeds in the laboratory. Data entry	Field station	13:30- 18:00
UMAG-IEB, UNT	1/2/12	Bird mist netting and feces collection	Omora Park	7:00- 12:00
UMAG-IEB, UNT	1/2/12	Julia: birds and invertebrates. Buena Vista group arrives.	Omora Park	14:00- 18:00
UMAG-IEB, UNT	1/2/12	Introduction to bird banding and insect sampling	Field station	20:30- 21:00
UMAG-IEB, UNT, Buena Vista	1/3/12	Bird mist netting and feces collection. Introduction to Omora and bird study for Buena Vista group. Lunch at Omora Park.	Omora Park	7:00- 17:00
UMAG-IEB, UNT, Buena Vista	1/3/12	Prepare hike to Cerro Róbaló.	Field station	19:00- 20:00
UMAG-IEB, UNT, Buena Vista	1/4/12	Hike to Lago Róbaló and set up the camp.	Cerro Robalo	All day
UMAG-IEB, UNT, Buena Vista	1/5/12	Introduction to high altitude ecosystems and activities. Start bird mist netting and insect sampling.	Cerro Robalo	All day
UMAG-IEB, UNT, Buena Vista	1/6/12 through 1/9/12	Bird mist netting and feces collection. Insects and seed sampling.	Cerro Robalo	All day
UMAG-IEB, UNT, Buena Vista	1/10/12	Descend from Róbaló Lake to return to Pto. Williams. Analysis of feces in the laboratory.	Cerro Robalo- Field station	All day
UMAG-IEB, UNT, Buena Vista	1/11/12	Analysis of feces and bird diet estimation.	Field station	9:00- 17:00

UMAG-IEB, UNT, Buena Vista	1/11/12	Prepare and present PowerPoint presentation with results and conclusions.	Field station	17:00- 19:00
UMAG-IEB, UNT, Buena Vista	1/12/12	UNT, UMAG-IEB groups go back to Pta. Arenas, and Santiago-DFW	Pto. Williams	To be determined
Buena Vista	1/13/12	Buena Vista group goes back to Pta. Arenas	Pto. Williams	To be determined

Please note- the program is subject to modifications based on weather and other logistical considerations.