Natural History of Spain: Teaching Students About Nature and Culture in a Foreign Country

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An ideal liberal arts and sciences undergraduate education in the 21st century should expose students to the natural world as well as to different human cultures. Unique to the College of Charleston’s semester abroad program in Spain, our Natural History of Spain course is designed to provide students with both immersion in natural history, as well as simultaneous immersion in foreign language and culture. Lengthy field excursions focus on basic nature observation and field annotation skills, exposing students to the unique flora and fauna of Spain across multiple ecosystems. An integrative approach comparing and contrasting environmental, cultural, and rural land use issues in Spain and the United States promotes conservation and emphasizes critical thinking skills. During semester-long offerings, Spanish language coursework and cultural immersion through lodging with host families rounds out the interdisciplinary course of study. Our approach allows for an in-depth and truly internationalized perspective, resulting in an integrative immersion in Spanish nature and culture that is grounded in time and place. Students responses highlight the importance of field trips and extended time spent immersed in natural settings as essential to their learning and overall experience. One hundred percent of students rated their international experience positively.


Natural history instruction is made more successful when students make their own natural observations, effectively communicate these observations, and achieve an understanding of place (Gilligan 2009, Fleischner 2011, Farnsworth and Beatty 2012). This rarely can be achieved in a standard classroom setting, and therefore the most effective natural history curricula take advantage of activities or travels that expose students to natural settings for extended periods of time (Trombulak 2009, Farnsworth and Beatty 2012).

Developing an intimate and loving relationship with nature can directly benefit biological scientists from multiple fields. Successful life science students search for high-impact learning opportunities to immerse themselves in natural settings through hands-on travel science courses or summer research internships. In addition, biology students today must also develop proficiency in a language other than English to increase their employability in a global marketplace upon graduation. Undergraduate students and their future employers appreciate the importance of experiencing life abroad for advancing personal growth, self-discovery, cross-cultural appreciation, leadership, and foreign language acquisition (Earnest 2003, Bohrer 2012). In response, more students today are seeking opportunities to study abroad, independently of their major (http://www.iie.org/en/Research-and-Publications/Open-Doors/Data).

Many U.S. colleges and universities are emphasizing global scholarship (Earnest 2003, Bohrer 2012). Adding proficiency in a foreign language to core curriculum goals has been an ongoing trend towards promoting a more internationalized perspective and skill set in undergraduate students. Immersion combined with study abroad incorporates a cultural aspect to foreign language study and is preferred to immersion in language alone (Kauffmann et al. 1992). Students report better long-term language skills growth if they live with host families rather than in dormitory or apartment setting with peers (Dwyer and Peters 2004). With respect to the length of time abroad, longer has been shown to be better (Dwyer 2004), but shorter programs can also have important, long-term, positive educational effects (Anderson et al. 2006, Farnsworth and Beatty 2012).

Yet study abroad programs that focus on natural science do not typically include a foreign language component.
The study abroad programs that include a foreign language component typically focus on language proficiency and are primarily aimed at students majoring in a foreign language. However, a trend towards more interdisciplinary foreign language study abroad programs is developing and the programs show promising results (Gorka and Niesenbaum 2001). International business programs were quick to promote this model (Shaftel et al. 2007). Science, technology, engineering and mathematics (STEM) disciplines, including biological sciences, have lagged behind their peers in business and humanities in following this model.

We initially designed a short summer Natural History of Spain course to immerse students in novel, foreign, natural settings using extended experiential field activities to teach natural history through exploration and observation, emphasizing the skills necessary to take field notes. We later augmented the objectives of our Natural History of Spain course to include an integrated cultural and Spanish language immersion experience when we taught a semester-long version of the course in 2012. The semester-long opportunity arose as part of a new, liberal arts initiative of the College of Charleston for the fall semester, aimed at complementing the college’s existing Hispanic Studies spring and summer programs. The multidisciplinary fall semester initiative began as a joint effort by faculty in the departments of Political Science, Communications, and Biology, and has grown to include faculty and students from other departments.

Natural History of Spain was first taught as an independent, 17-day-long travel course in May 2009 and did not include instruction in Spanish language. During the first half of the short, “Maymester” course, different Mediterranean ecosystems were studied around the town of Trujillo, in southwestern Spain, while students stay at a local hostel. Oceanic and alpine environments were explored while travelling by van through northern Spain in the second half of the course.

The second time Natural History of Spain was taught it became a semester-long version and included weekly, full-day field excursions, a separate, 8-day field excursion to northern Spain, living in Trujillo with Spanish host families, and studying Spanish as a second language with local SSL Instructors. The semester-long course was offered from September to December, 2012 along with Political Science courses and a lecture-based Conservation Biology course.

Natural History of Spain will be offered again as a semester-long version in fall 2014 along with English courses, and in fall 2015 along with Anthropology and History courses. Beyond 2015, Natural History of Spain will alternate between the shorter “Maymester” and full-semester versions, depending on faculty availability and the rotating Trujillo fall program scheduling. Future course offerings in Trujillo may also include Communications, Sociology, Art History, Historical Preservation, Geology, and Environmental Studies.

Natural History of Spain: Detailed Description

We designed a course on the Natural History of Spain to combine the benefits of immersing students in a foreign setting with extended field activities in nature. The educational goals of the course emphasize field observation and annotation skills. While some students had previously travelled to Spain, they had only visited large cities as tourists and had not explored Spain’s rural and natural habitats. The course is mainly based out of the town of Trujillo, in the region of Extremadura, in southwestern Spain. The College of Charleston has had semester-long and summer study abroad Spanish language immersion programs in this town for more than a decade, utilizing an experienced group of dedicated host families.

Trujillo is a rural town of about 10,000 inhabitants, well known for its medieval architecture. It is surrounded by extensive Mediterranean holm oak (Quercus ilex) savannah forests (known locally as “dehesas”) and a diversity of Mediterranean natural and humanized habitats, including scrub oak, chestnut and pine forests, steppes, alpine meadows, lacustrine and riverine environments, and extensive agricultural fields.

The Natural Park of Monfragüe is located only 40 km north of Trujillo and is considered to be one of the best locations in the world to observe European birds. The largest wintering grounds of European cranes (Grus grus) are located in agricultural fields 40 km south of town, great bustards (Otis tarda) can be observed courting in leks in the steppes surrounding Trujillo, and the town itself is a major nesting site for white storks (Ciconia ciconia), lesser kestrels (Falco naumanni), and many other birds.

The diversity and proximity of so many ecosystems near Trujillo allows for field trips that focus on specific Mediterranean habitats or land uses (Appendix 1) and also allows students to make interesting natural observations and discoveries during their day-to-day activities. Rare observations made by students while walking around the town of Trujillo include charismatic birds such as Spanish imperial eagles (Aquila adalberti,
only 450-600 individuals worldwide and listed by IUCN as “vulnerable”) and black vultures (Aegypius monachus, 1500 pairs in Spain and listed as “near threatened”; www.iucnredlist.com). Day-long field trips that focus on Mediterranean habitats around the town of Trujillo are complemented with an 8-day field trip to northern Spain to explore other ecosystems, including coastal and alpine meadows, beech and deciduous oak forests, Australian eucalyptus and American conifer commercial plantations, and estuarine mud flats (Appendix 1).

Maintaining detailed notes is an important aspect of doing field biology and is a skill that most undergraduate students do not learn during regular, campus-based academic experiences. All students are provided with their own field notebook before travelling to Spain, and they are taught how to make effective observations both through a specific lecture and with assigned readings (Canfield 2011). The instructors regularly provide constructive feedback to the students on the quality and detail of their notes and drawings. Field notebooks are collected and graded at the halfway point and conclusion of the course. Emphasis is placed on making detailed field notes that will help students identify specific organisms, focusing both on describing and drawing observed physical attributes (leaf shapes, fruits characteristics, color markings, animal tracks, etc.), behavioral attributes (call songs, flight characteristics, flocking, etc.), and ecological attributes (density of individuals, interspecific associations, vegetation gradients, etc.).

The maintenance of a field journal complements the requirement to identify 145 different organisms; field notebooks must include information and notes about the observation of these species. Students analyze their field notes regularly after field trips, and in consultation with field guides, augment their original field observations.

The use of a pre-set list of organisms for this requirement was adopted from the marine biology courses taught at the Hofstra University Marine Laboratory in Priory, Jamaica by Eugene Kaplan and John Morrissey. A list of organisms to be identified provides the class with a shared goal to accomplish and encourages students to collaboratively search for specific organisms while in the field. It also forces students to make detailed observations so they can identify organisms to the lowest taxonomic level possible. Instructors highlight characteristics or habits of specific organisms that are typically observed during a given field trip, but students make many observations of rare organisms at unforeseen times. During field trips, the instructors make an active effort not to give away identifications to the students, encouraging them to make their own observations and recognize important characters that will allow them to identify organisms independently. Instructors do encourage and facilitate identifications by pointing out the existence of tracks and scat along the path, leading students to vantage points where specific species can be observed, convincing students to go on night walks so nocturnal species can be detected, or pointing out the existence of previously unobserved species in a specific habitat, without giving away their identity.

The list of organisms to be identified includes 145 species, and is modified depending on the season when the course is offered (May, or September-December) to account for different reproductive cycles of plants and fungi, and seasonal migration patterns of birds. All students carry their own bird identification guide in English, and a collection of English and Spanish field guides for the other taxa is distributed among the students at the beginning of the course. Maymester students were initially challenged by having to use some guides written in Spanish, which we use since many English publications do not include Iberian Peninsula endemic species. The organism list includes common species that can be easily observed in urban settings around the town of Trujillo, along with rare or cryptic species that students will likely not observe during the course, such as the critically endangered Iberian lynx (Lynx pardinus).

The list is biased towards the observation of birds (72 species) because of their high diversity in the region of Extremadura, but includes plants (trees, perennials, and annuals, a total of 39 species), fungi, fishes, amphibians, reptiles, and mammals. A minimum of 3 or 4 students (depending on class size) must observe each organism, which promotes collaboration and communication among students while in the field. Also, original notes about the observations of each observed species must be entered in the field notebooks of the students that claim to have made the observations. This encourages students to carry and use their field notebooks wherever they go and also reduces the temptation to break the course’s honor code and have single students “make up” observations of organisms that nobody else has seen. After the completion of all the field trips, the students must present their completed list of identified organisms and the corresponding field notebook entries. If any organisms on the list were not observed during the duration of the course, then students must present detailed observations of “substitute” organisms that were not on the original list. This encourages students to identify as many organisms as possible, and has led to
students making some very interesting and unexpected observations, including the identification of invasive Australian black swans (*Cygnus atratus*) and American monk parakeets (*Myiopsitta monachus*).

Small vans or mini-buses are used to transport students to field trip locations, but hiking/walking is the preferred mode of locomotion at the field sites. Students carry food and water for the day, plus binoculars, field journals, and local field guides. The instructors carry a pair of spotting scopes and tripods. While instructors lead the walks, students are encouraged to break off, sprint ahead or lag behind in order to make their own observations. Field trips are designed to include long hikes far away from urban centers and roads whenever possible, taking breaks to have lunch and drinks in the middle of natural settings, in order to give students a sense of place for the ecosystem being explored that day (Taylor and Tallmadge 2009). Multiple times during the course, students will be purposely left by themselves for one or two hours with the objective of making their own individual organismal identifications, but with the secondary goal of allowing students to immerse in and experience, by themselves, a new natural environment. Based on informal student feedback, these contemplative exercises in solitude were very effective learning experiences, especially when taking place in the stark alpine environments in Picos de Europa National Park and the extensive steppe habitats nearby Trujillo, two locations that provide spectacular scenery and great wildlife observation opportunities.

Traditional and modern land uses and agricultural practices typical of rural Spain (Grove and Rackham 2003) are taken into account when planning excursions and emphasized to students both in lectures and while in the field. The integration of nature and agriculture is highlighted by walking through terraced hillsides, traditional subsistence agriculture plots, extensive monocultures (rice, corn, tomato, wheat), traditional dehesas managed for pig, sheep, cow, or goat production, as well as those managed for trophy hunting. During field trips in private lands, we plan on-site discussions with the farmers and game wardens responsible for their management. Traditional land use practices are also highlighted while in national parks, since they are an important part of the management plans (hunting, logging, ranching, etc.) for those areas. The analysis of Spanish cultural landscapes serves as a clear contrast to the North American rural and suburban land use practices that our students are more familiar with. The effects of sustainable and non-sustainable land use practices on biological diversity are highlighted both in lectures and in the field.

Having instructors that speak fluent Spanish is essential for establishing meaningful conversations with local farmers and property owners. A local, professional nature guide that spoke rudimentary English was employed for two field trips during the initial Maymester offering, and would be helpful to employ again by non-Spanish speaking instructors.

**Cultural Immersion and Interdisciplinary Approach**

The opportunity to augment our Natural History of Spain course with Spanish language and cultural immersion through an interdisciplinary and integrative approach arose when it became possible to teach the course as part of a semester-long study-abroad experience in Trujillo during the fall of 2012. Non-Spanish majors can now utilize and improve their Spanish skills in an immersion setting with host families, but are also able to take courses toward their majors that are taught in English, not Spanish. The Natural History of Spain course fits in beautifully with the cultural and the language immersion, resulting in clear and informed sense of place.

All fall 2012 students took Natural History of Spain independently of their major, and it was the pivotal anchoring course for the program. All students also registered for Geographies and Politics of Spain and one of the two levels of Spanish language courses offered. To round out their schedules, students could either choose Conservation Biology (an upper-level biology majors course) or Geographies and Politics of the European Union (an upper-level Political Science course). Full-day field trips were held on Thursdays as the laboratory portion of Natural History of Spain course. Lectures were given Monday through Wednesday. No classes were held on Fridays in order to facilitate cultural immersion with host families as well as to encourage occasional travel throughout Spain and Europe.

Field sites outlined in Table 1 were originally chosen for their natural history and cultural relevance, but tied in well with interdisciplinary themes in Political Science and Spanish vocabulary. Students and instructors try to bring lunches consisting of locally produced products including bread, cheese, cured meats, and produce. The shared lunches and foods result in a purposefully common experience that connects students to the land uses and drives home lessons in biodiversity and ecosystem services. Lunches are eaten as far off the beaten track as possible, preferably in the middle of nowhere, or perched upon an isolated outcrop or peak after a hike (food always tastes better with a view and a sense of place).
In addition to the field sites listed in Table 1, we lead students on cultural trips to explore the cities and towns of Caceres, Merida, Bermeo, Bilbao, Madrid, Toledo, and El Escorial, and included trips to the Reina Sofia, el Prado, and Guggenheim art museums, the Merida Museum of Roman Art, and a Spanish First Division soccer game. These visits allowed for further immersion in Spanish culture, exploration of Spanish urban environments, and highlighted important contrasts in the political and geographical landscapes of Spain. Both the interdisciplinary and international aspects make the Natural History of Spain course unique.

Student Feedback

At the end of the course, students were prompted to provide feedback on their experiences by answering a questionnaire that was not shared with the Instructors until the course grading was completed. Not surprisingly, 95% of students ranked their learning experience during the field trips above the time spent in lectures and discussions in the classroom setting. Still, many students acknowledged the value that lecture time had in preparing them for the field trips. When asked to describe “What aspect of the Natural History of Spain course was most effective for your learning?” most of the answers revolved around the value of field trips and spending time immersed in nature (Appendix 2). While the high educational value of immersing students in the natural world is not a surprise for anyone who has worked as field biologists, it is reassuring to see such a consensus among standard college students in the 21st century. These responses highlight the need to promote natural history and field courses among the new generations of college students (Noss 1996; Futuyma 1998).

Student evaluation comments frequently emphasized the impact that getting outside one’s comfort zone had on enhancing their progress in both field biology and Spanish language proficiency. Several students indicated that while the natural history skills they gained were astounding, what really set the course apart was the international venue and the cultural immersion. Numerous students indicated their appreciation for getting off the beaten path and developing an informed, profound connection to Spain that contrasted wildly from their understanding of new places obtained through shallow, tourist-style exploration. Students in the semester-long Fall 2012 course indicated that one of the ways in which their world views had changed was in interpreting how different cultures view the United States, rather than just how their view of Spaniards or Europeans had been modified, indicating higher order thinking and meaningful personal growth. Students also indicated changes in their sense of interconnectedness between food production and consumption, respect for differences in environmental management between cultures, and a humbling sense of living simply in Spain that they hoped would translate back to their life in the U.S. in order to promote conservation of biodiversity and more purposefully sustainable living (Appendix 2).

One-hundred percent of students that participated in the Natural History of Spain course viewed the international experience positively and concluded that the course and its cultural immersion had positively modified their world-view. All responding students said their initial lack of Spanish fluency was not an impediment to their enjoyment of the experience, and all fall students rated their room and board experience with host families positively (Appendix 2).

Differences in student course evaluations between the short Maymester 2009 and the full Fall 2012 Natural History of Spain courses indicate that cultural immersion also occurred with the shorter course, but not to the extent delivered through the semester-long fall course. The majority of the Maymester students remarked that they longed for a lengthier course.

We strive to keep the program affordable (under $6000 including travel, room and board for the fall semester) so that it is accessible to all socioeconomic groups that the College of Charleston serves. Regular scholarships and financial aid packages are directly applicable to College of Charleston tuition. Students are also eligible for substantial study abroad scholarships through the College of Charleston’s International Studies Program.

Concluding Remarks

Effectively teaching natural history in a field setting is essential to ensure that future generations of college graduates and natural science professionals appreciate the value of studying organisms in a natural context and the importance of preserving natural areas. We also believe that in the 21st century’s age of globalization, effective future naturalists and conservationists will need to operate in a global economy and society. Our course in Natural History of Spain provides college students with much needed knowledge in natural history, and also provides them with a unique multicultural training achieved by immersing students in a foreign culture and novel natural places in Spain. This unique combination will hopefully prepare participating students to effectively study, appreciate, and defend both local and global natural areas in the future.
Acknowledgements

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Literature Cited


Appendix 1. Day-long field trips, listing the main ecosystem/habitat explored and the name of the nearest town or protected area.

Field Trips near the town of Trujillo

- Granitic outcrops and steppe flatlands around Trujillo
- Mediterranean small scale agriculture and forestry around Garciaiz
- Dehesa or Savannah Forests in Monfrague National Park
- Alpine (granite) habitats in Gredos Mountains Natural Park
- Bird of prey recovery center and steppe flatlands around Caceres
- Mediterranean forest formations in Sierra de Villuercas.
- Big game management exploitations in Sierra de San Pedro
- Silvo-pastoral pig and sheep exploitations near Deleitosa
- Lacustrine habitats and rice plantations near Pizarro

Field Trips in Northern Spain

- Alpine (limestone) habitats in Picos de Europa National Park
- Beech forests in Picos de Europa National Park
- Karstic valley ecosystems in Picos de Europa National Park
- Riverine ecosystems along River Sella near Arriondas
- Australian eucalyptus and American conifer forests near Bermeo
- Coastal oak forests and estuarine habitats in Urdaibai Biosphere Reserve
Appendix 2. Examples of student responses to end of course qualitative survey questions.

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<tr>
<th>Emphasis</th>
<th>Responses</th>
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<tr>
<td>Natural History</td>
<td>“…being able to go out hiking and identify the organisms that we saw... it was like a puzzle and a treasure hunt combined.”</td>
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<td></td>
<td>“…less time in a classroom and more time doing work in the field/hiking was definitely very effective for learning”</td>
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<td>“… enjoyed being allowed to just go off and explore by ourselves or in small groups for long periods of time…”</td>
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<td>“…since Spain has been inhabited and exploited by humans for thousands of years, there is more to learn about what transformations have occurred that have changed the original habitats and ecosystems.”</td>
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<td>“…identifying birds, reptiles and mammals every day for three weeks reinforces the ability to use guides easily. Seeing the animal, jotting down field notes and then identifying the animal really helped…”</td>
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<td>“…field observations and the instructors’ on-site explanations and lessons really were the best way that I learned and retained information…”</td>
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<td>“I really enjoyed the field trips, especially visiting the wildlife sanctuary, slaughter house, and solar energy farm”</td>
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<td>“…the world is even more interconnected than I had previously thought, particularly concerning species dispersal. Seeing how other countries are dealing with conservation and environmental protection issues was great for opening my mind up…”</td>
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<td>“…seeing organisms over and over again really helped my learning…”</td>
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<td>“…an entire day devoted to going out and exploring… was an amazing opportunity to learn… in beautiful, species-rich locations.”</td>
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<td>“I got to experience new ways of living, like Dehesa farming, that are more sustainable than the U.S. way of farming.”</td>
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<td>“…field trips were by far the most informative and important part of my time in Trujillo.”</td>
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<td>“I’m a hands-on learner, so it was nice to be able to work in the field as opposed to sitting in a classroom and taking notes from Power Points.”</td>
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<td></td>
<td>“…the decision to teach the course in Spain was especially helpful for a natural history course because of… all the unique regions of the country.”</td>
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<td>“…different ways people use and exploit the environment and their introduction of species have affected not just the US but… the world.”</td>
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<td>Cultural Immersion</td>
<td>“It was not an inconvenience, but a learning experience, and made my experience better than if I hadn’t had to speak Spanish”</td>
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<td></td>
<td>“My Spanish greatly improved… I could have conversations…”</td>
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<td>“…the language barrier adds to the ‘specialness’ of the class.”</td>
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<td></td>
<td>“Especially cool was the opportunity we had to more fully understand Spain’s place in Europe; on both a political and ecological level.”</td>
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<td></td>
<td>“In Spain… I realized how other people view us.”</td>
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<td></td>
<td>“…humbling. It helps you realize what you do and do not need in life.”</td>
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