

## **Human Ecology and Conservation in the Tropics**

### ENVI-3000 (3 credits)

### **Panama: Tropical Ecology, Marine Ecosystems, and Biodiversity Conservation**

*This syllabus is representative of a typical semester. Because courses develop and change over time to take advantage of unique learning opportunities, actual course content varies from term to term.*

#### **Course Description**

This course focuses on the relationships and challenges that coexist between human manipulation of the natural resource base and its conservation. Students study the roots and causes of deforestation, hunting, mangrove clearing, overfishing, hydroelectric dam building as well as projects, programs, movements, and initiatives aimed at addressing consequent social and environmental conditions. Through lectures from academics, researchers, practitioners, and community leaders, students gain insight into and learn about the challenges local and regional populations face as they seek to conserve their natural base. Students live with and learn from diverse populations when they engage in rural homestays with subsistence agriculturalists, indigenous families, families living in buffer zones of protected areas, and in urban homes.

#### **Learning Outcomes**

By the end of the course, students will have had the opportunity to attain the following:

- An intimate understanding of the principle human and environmental factors that induce resource use, conservation and/or conflict in Panama.
- Greater awareness of the challenges local populations and resource users face when determining and making decisions over resources.
- An understanding of the major challenges to conservation and their intersection with human survival in Panama and in the tropics in general.
- The opportunity to become intimately familiar with current projects that impact the Panamanian natural resource base and their profound effect on local populations.
- The ability to assess how global trends, national policy, and rural-urban dichotomies affect local resource use and decision making.

#### **Language of Instruction**

This course is taught in English and students will be exposed to Spanish vocabulary related to course content through in-country lectures and field visits.

## Instructional Methods

SIT's teaching and learning philosophy is grounded in the experiential learning theory developed by Kolb (1984; 2015) and informed by various scholars, such as Dewey, Piaget, Lewin, among others. Experiential learning theory recognizes that learning is an active process that is not confined to the formal curriculum; "knowledge is created through the transformation of experience" (Kolb, 2015, p. 49). Learning involves both content and process. Learning is holistic and happens through various life experiences upon which students draw to generate new ways of knowing and being. Learning involves a community and is a lifelong endeavor. Learning is transformational. The suggested four step-cycle of a *concrete experience, reflective observation, abstract conceptualization, and active experimentation* embedded in the experiential learning model is not linear and might not always happen in that specific order, as any learning is highly context dependent. These stages of taking part in a shared experience; reflecting on that experience by describing and interpreting it; challenging their own assumptions and beliefs to generate new knowledge; and ultimately applying new knowledge, awareness, skills, and attitudes in a variety of situations and contexts are important for students to engage in to become empowered lifelong learners.

## Course Requirements

### Assignments

- Students will sign up for a thematic group of their choice - according to their thematic interest.
- Each group will read all of the readings listed in the syllabus.
- Each group will develop written responses to the assigned questions and submit these electronically before the day of the discussion.
- Each group will make an oral presentation on their topic. That is, each thematic group will present once during the semester.
- The presentation should include:
  - a critical analysis of the readings and the topic
  - deeper insight into the topic
  - respond to the assigned questions
  - participation from each group member
  - reflect on the groups' interviews
  - quality work
  - adhere to the presentation guidelines for oral presentations and power points
- At each site, students will interview assigned local stakeholders. The findings of the interviews will be integrated into and cited in the students' written responses and oral presentations. A minimum of four interviews should be cited. If four or not cited, points will be loss for the group grade. Each group will determine the content of their interviews. Interviews serve to fill information gaps, respond to unanswered questions, and provide greater insight into specific topics.
- The thematic group that presents does not submit written responses for their topic.
- For all presentations throughout the program, including staff lectures and student presentations, students in the audience are expected to refrain from using electronic devices. If this occurs, students will cause a loss of points in their grade.

- Citations made in the responses and presentations should follow the format described in the “In-text citation” document provided via dropbox.

## Evaluation and Grading Criteria

### Assessment

Timely completion of all assignments is expected. Late submissions will be penalized.

Responses to assigned questions will be evaluated in the following manner:

Organization (10%)

Analysis (30%)

Depth (30%)

Substantiation of arguments (30%)

Oral presentations will be evaluated according to:

Organization (5%)

Equal participation among group members (10%)

Depth of discussion (30%)

Adequate responses to assigned questions (20%)

Substantiation of arguments (30%)

Following instructions (above) (5%)

Participation is crucial to student success in this course and will be gauged based on student contribution to discussions, involvement during excursions, respect for the host culture, punctuality, cooperation, and flexibility. Attendance at all program activities is mandatory.

Final course assessment:

Oral presentation	20%
Short essay questions 1	20%
Short essay questions 2	20%
Short essay questions 3	20%
Short essay questions 4	20%

### Grading Scale

94-100%	A	Excellent
90-93%	A-	
87-89%	B+	
84-86%	B	Above Average
80-83%	B-	
77-79%	C+	
74-76%	C	Average
70-73%	C-	
67-69%	D+	
64-66%	D	Below Average
<64	F	Fail

## Program Expectations

Please...

- Come prepared. Be on time, have your readings completed and points in mind for discussion or clarification.

- Complete assignments on schedule. This will help you keep up with your classwork and ensure you don't fall behind.
- Ask questions in class. Engage the lecturer. The speakers and professors you will meet are leaders in their fields in Panama. Take advantage of the opportunity.
- Comply with academic integrity policies (no plagiarism or cheating, nothing unethical).
- Respect differences of opinion (classmates, lecturers, local constituents engaged with on the visits, someone you may sit next to on the bus). You are not expected to agree with everything you hear, but you are expected to listen across difference and consider other perspectives with respect.
- Consider your place and position in all dimensions. Demonstrate culturally appropriate behavior and expression always.

## SIT Policies and Resources

Please refer to the [SIT Study Abroad Handbook](#) and the [Policies](#) section of the SIT website for all academic and student affairs policies. Students are accountable for complying with all published policies. Of particular relevance to this course are the policies regarding: academic integrity, Family Educational Rights and Privacy Act (FERPA), research and ethics in field study and internships, late assignments, academic status, academic appeals, diversity and disability, sexual harassment and misconduct, and the student code of conduct.

Please refer to the SIT Study Abroad Handbook and SIT website for information on important resources and services provided through our central administration in Vermont, such as [Library resources and research support](#), [Disability Services](#), [Counseling Services](#), [Title IX information](#), and [Equity, Diversity, and Inclusion](#) resources.

## Course Schedule

*\*Please be aware that topics and excursions may vary to take advantage of any emerging events, to accommodate changes in our lecturers' availability, and to respect any changes that would affect student safety. Students will be notified if this occurs.*

### Orientation week - Dr. Aly Dagang

Introduction to conservation in Panama

Please read:

- Finley-Brook, M 2014 Green neoliberal space: The Mesoamerican Biological Corridor. In: Stevens, S (ed.) Indigenous peoples, National Parks, and Protected Areas: A New Paradigm linking Conservation, Culture, and Rights. Tucson: University of Arizona Press.
- Bansal S 2017 17 Development clichés I will be avoiding in 2017. The Development Set. <https://thedevelopmentset.com/17-development-clich%C3%A9s-ill-be-avoiding-in-2017-46c2345a507f#.2ij6wuo7w>

### Human ecology discussion with Aly at USMA

El Cope National Park, Barrigón, Coclé

Topic: **Payment for environmental services (PES) as a vehicle for conservation**

### Readings:

- Broadbent EN 2012 The effect of land use change and ecotourism on biodiversity: A case study of Manuel Antonio, Costa Rica, from 1985 to 2008. *Landscape Ecology* 27:731-744.
- Duke, E. A., Goldstein, J. H., Teel, T. L., Finchum, R., Huber-Stearns, H., Pitty, J., ... & Sánchez, L. O. (2014). Payments for ecosystem services and landowner interest: Informing program design trade-offs in Western Panama. *Ecological Economics*, 103, 44-55.
- Lansing, D. M. (2017). Understanding Smallholder Participation in Payments for Ecosystem Services: the Case of Costa Rica. *Human Ecology*, 1-11.
- Lund, J. F., Sungusia, E., Mabele, M. B., & Scheba, A. (2017). Promising change, delivering continuity: REDD+ as conservation fad. *World Development*, 89, 124-139.

### Further reading:

- Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., ... & Turner, R. K. (2014). Changes in the global value of ecosystem services. *Global Environmental Change*, 26, 152-158.
- Fletcher, R., & Büscher, B. (2017). The PES Conceit: Revisiting the Relationship between Payments for Environmental Services and Neoliberal Conservation. *Ecological Economics*, 132, 224-231.
- Kirkby CA, Giudice R, Day B, Turner K, Soares-Filho BS, Oliveira-Rodrigues H, and DW Yu 2011 Closing the ecotourism-conservation loop in the Peruvian Amazon. *Environmental Conservation* 38(1): 6-17.

### Assignment questions:

1. According to Broadbent et al. what is the potential for ecotourism to positively impact forest conservation? What are the potential downsides? What are the challenges? Discuss and analyze their findings.
2. Based on Duke et al.'s findings, how does inclusion and exclusion of socioeconomic groups impact PES conservation efforts? In your opinion, and drawing on Duke et al. (and the other readings if you'd like), should poverty alleviation be a goal of PES programs?
3. According to Lund et al., what obstacles has REDD+ implementation faced in Tanzania? Why hasn't it seen success? What are their recommendations? What is the "green grab"? What is your opinion of it?
4. Based on Lansing's findings, what drives landholder participation in PES programs? Why? In Lansing's article on page 8, a Costa Rican law regarding private on-farm forest land management is described. In your opinion, is this law beneficial? Discuss and defend your position.

\*\*\*Please remember to integrate information from your conversations with community members into your written responses and your oral presentation.\*\*\*

**Please note:** For the assignment, please talk with four of the following stakeholders – Sr. Macedonio, Sr. Ariel hijo, Sr. Ariel padre, Sr. Faustino, Sra. Ana, Sra. Micaela, any of the park

guards, your homestay family, or any other community members of Barrigón. Please be sure all group members participate in the conversations.

Human Ecology La Amistad discussion Dr. Aly Dagang – Payment for Ecosystem Services questions and oral presentation due; Protected Area Effectiveness, Challenges, and Seeking Means

La Amistad International Park buffer zone, Cerro Punta, Chiriquí

Topic: **La Amistad UNESCO Biosphere – the intersection of protected areas and human communities**

Introduction to the La Amistad UNESCO Biosphere – geography, resources, use, and risks for conservation

Readings:

- Candanedo IS 2010 Nature-Culture Interactions among Peasant Communities near La Amistad Trans-boundary Park, Panama and Costa Rica. PhD Thesis. University of Essex, 47-81p.
- Miller LF 2011 Geographies of governance across La Amistad National Park. MS Thesis, Western Washington University, 1-18, 58-69, 74-91.
- Cetas, E. R., & Yasué, M. (2017). A systematic review of motivational values and conservation success in and around protected areas. *Conservation Biology*, 31(1), 203-212.
- Pringle, R. M. (2017). Upgrading protected areas to conserve wild biodiversity. *Nature*, 546(7656), 91-99.

Further reading:

- Hofstede R and A. Monroy Ojeda 2013 Report on the reactive monitoring mission to Talamanca Range La Amistad Reserves/La Amistad National Park – Costa Rica and Panama from 17 to 24 January 2013. Report to the UNESCO World Heritage Committee, 37<sup>th</sup> session, Phnom Penh, Cambodia, 16-27 June 2013, 1-20 p.

**Please note:** Please talk with four of the following stakeholders: members of GORACE, members of AMIPILA, members of FUNDICCEP (see Miller 100-103), PILA park guards, Sr. Omar in Volcan, Cerro Punta business owners and employees, your Guadalupe homestay families, agricultural workers, and/or any other Cerro Punta residents.

Assignment questions:

1. What are the historical factors that have influenced resource use patterns in the PILA buffer zone? Discuss the Costa Rican and Panamanian park decrees. What are the perceived strengths and weaknesses? Explain the UNESCO biosphere and its seven protected areas.
2. Stakeholder participation has been regarded as the holy grail of conservation practice. What do Cetas and Yasué say about the impact of community participation in protected area conservation projects? In the same vein, alternative livelihood strategies (ALS) have been a cornerstone of community conservation strategies. What did the authors find regarding ALS – how does this challenge current dogma? If you were involved in a

conservation project, would you advocate for the use of intrinsic or extrinsic motivations? Why?

3. Pringle's article characterizes two large-scale, reportedly successful conservation projects. The reported success of the ACG is unique, if not singular, in the Neotropics. Discuss what the author finds to be key(s) to this success. Is there space for critique? What-why-how? Please reflect on this idea from page 97: "The alleviation of poverty is both a motivation for resuscitating protected areas and a practical necessity for any dream of conservation in perpetuity." Can conservation and poverty alleviation work in tandem? Is it achievable or is it a mythical ideal? Please respond and explain. According to Pringle, what is the role of government? In this context, what are the risks government take in actively supporting protected areas and how does he suggest mitigating these?
4. Based on your interviews, conversations, and observations, what are the principle threats to conservation in PILA? What are their root causes? What are their drivers? What is being done to strengthen conservation of PILA? Explain and discuss. Please provide concrete examples.

Human Ecology discussion with Aly - Framing the role of agriculture and food production within tropical conservation

Changuinola, Bocas del Toro and EARTH University, Costa Rica

**Topic: The role of food production in tropical conservation**

Readings:

- Mendenhall CD (2014) Predicting biodiversity change and averting collapse in agricultural landscapes. *Nature* 509:213-217.
- Tschamtker, T., Clough, Y., Wanger, T. C., Jackson, L., Motzke, I., Perfecto, I., ... & Whitbread, A. (2012). Global food security, biodiversity conservation and the future of agricultural intensification. *Biological conservation*, 151(1), 53-59.
- Laurance, W. F., Sayer, J., & Cassman, K. G. (2014). Agricultural expansion and its impacts on tropical nature. *Trends in ecology & evolution*, 29(2), 107-116.
- Shaver, I., Chain-Guadarrama, A., Cleary, K. A., Sanfiorenzo, A., Santiago-García, R. J., Finegan, B., ... & DeClerck, F. (2015). Coupled social and ecological outcomes of agricultural intensification in Costa Rica and the future of biodiversity conservation in tropical agricultural regions. *Global Environmental Change*, 32, 74-86.

**Please note:** Please talk with your homestay family in Costa Rica, and three or more of the following stakeholders: Sr. Orlando Lozada (cacao farmer and president of ASAP), Sra. Zeneida Rodriguez (cacao farmer), Sr. Ernesto Orozco president of COOSEMUPAR, students from EARTH University, and/or any other person invested in food production and conservation in Panama or Costa Rica.

Further reading:

- Jones J 2014 Avian diversity across three distinct agricultural landscapes in Guadalupe, Chiriquí Highlands, Panama. SIT Digital Collections. – optional reading sample ISP
- Vilchez Mendoza S 2014 Consistency in bird use of tree cover across tropical agricultural landscapes. *Ecological Applications* 24(1): 158-168.

Assignment questions:

1. According to Mendenhall, agricultural landscapes have an important role to play in environmental conservation. Discuss the articles' conclusions and their utility.
2. Reflect on the articles. Develop five unique policies aimed at boosting conservation in agricultural landscapes that minimally impact food production. Base your responses on the articles' findings, recent lectures, field experiences, and your interviews. Be sure to discuss the pros and cons of your policy ideas with stakeholders before presenting them in your responses. In your response, include your audience, the mechanism(s), the expected outcomes, the challenges to implementation, and the monitoring and evaluation processes for each policy. Make sure your policies are **novel and innovative** (avoid organic agriculture, recycling, and other policies that have become customary practices in other places). **Get creative!**
3. Discuss Tschardt et al. and Laurance et al. What are their findings? What are their recommendations? What are your thoughts and opinions?
4. Discuss Shaver et al. What were their hypotheses? What are their findings? Speak with several different people in La Argentina (where pineapple plantations carpet the landscape). Ask them about their perspectives. Provide an in-depth account and analysis of your findings.

Date TBD PILA protected area questions due and oral presentation

Date TBD Changuinola

Visit to Finca La Magnita – organic, agroforestry cacao family farm  
Visit to COOBANA – banana plantation and workers cooperative

Date TBD Changuinola

Human Ecology Discussion with Aly – Indigenous peoples and resource use

Sieykin, Territorio Naso, Teribe River, Bocas del Toro

**Topic: Indigenous peoples and resource use**

Readings:

- Paiement, JJ 2007 The tiger and the turbine: Indigenous rights and resource management in the Naso territory of Panama. Doctoral dissertation, McGill University, 52-58; 116-123; 128-151.
- Vergara-Asenjo G and C Potvin 2014 Forest protection and tenure status: The key role of indigenous peoples and protected areas in Panama. *Global Environmental Change* 28, 205-215 p.
- Stevens, S 2014 Advancing the new paradigm: Implementation, challenges, and potential. In: Stevens, S (ed.) *Indigenous peoples, National Parks, and Protected Areas: A New Paradigm linking Conservation, Culture, and Rights*. Tucson: University of Arizona Press.
- Smith, D. A., Holland, M. B., Michon, A., Ibáñez, A., & Herrera, F. (2017). The hidden layer of indigenous land tenure: informal forest ownership and its implications for forest use and conservation in Panama's largest collective territory. *International Forestry Review*, 19(4), 478-494.



Further readings:

- ANAI 2010 Threats to biodiversity and ecosystem function of proposed hydroelectric dams in the La Amistad World Heritage Site, Panama and Costa Rica. A Report to the UNESCO World Heritage Committee on the status of the La Amistad International Biosphere, 11-36, 68-88 p.

**Please note:** Please interview four stakeholders, including your Naso homestay family, our Naso program site coordinator Sr. Edwin Sanchez, and/or any other Naso community members.

1. Reflect on your recent learning experiences, the readings, and the discussion at FUNDICCEP, can hydroelectric projects be a part of the landscape in indigenous lands? Can indigenous peoples benefit from hydroelectric dams in their territories? Dams are regarded as a source of clean energy (in some cases they qualify for carbon credits) and they have been a vehicle for development as well as conservation (PILA park decrees). If you agree, explain and defend your points of view. If you are opposed, discuss your arguments and suggest alternatives.
2. Discuss Vergara-Asenjo and Potvin's arguments and conclusions. Do you agree with their assertions? Do your insights from your interviews converge with the conclusions they draw? Explain and cite.
3. According to Smith et al., land tenure has important impacts on the conservation of forests owned by indigenous peoples. How does tenure purportedly affect forest conservation? Is it all good? Please explain. How does this play out in the Ngobe context? You can reflect on your observations from Cerro Punta, if this applies.
4. What are the challenges to the implementation and practice of the "New Paradigm," according to Steven's, *Advancing the new paradigm*? What are your perceptions regarding the challenges to its application?

Date TBD Human Ecology Discussion with Aly – Agricultural landscapes debrief; questions and oral presentation due

Date TBD Human Ecology discussion with Aly – Indigenous peoples and resource use; questions and oral presentation due

Isla Porvenir, Comarca Guna Yala

**Topic: Marine conservation and local livelihoods**

Date TBD Human Ecology discussion with Aly - Marine conservation and human livelihoods

Readings:

- Solis Rivera V, Borrás MF, Gallardo DB, Ochoa M, Castañeda E, and G Castillo 2012 Regional study on social dimensions of marine protected area practice in Central America: Case studies from Honduras, Nicaragua, Costa Rica, and Panama. Monograph, International Collective in Support of Fishworkers, 84-109 p.
- Hoehn S and B Thapa 2009 Attitudes and perceptions of indigenous fishermen towards marine resource management in Kuna Yala, Panama. International Journal of Sustainable Development and World Ecology, 16:6, 427-437 p.

- Apgar, M. J., Allen, W., Moore, K., & Ataria, J. M. 2015. Understanding adaptation and transformation through indigenous practice: the case of the Guna of Panama.
- Christie, P., Bennett, N. J., Gray, N. J., Wilhelm, T. A., Lewis, N. A., Parks, J., ... & Taei, S. (2017). Why people matter in ocean governance: Incorporating human dimensions into large-scale marine protected areas. *Marine Policy*, 84, 273-284.
- Gill, D. A., Mascia, M. B., Ahmadi, G. N., Glew, L., Lester, S. E., Barnes, M., ... & Holst, S. (2017). Capacity shortfalls hinder the performance of marine protected areas globally. *Nature*, 543(7647), 665-669.

Further readings:

- B Moritz 2014 Fishermen incentives for observing lobster management policies in Narganá, Corazón de Jesús, and Digir, Guna Yala - ISP paper. – optional reading relevant ISP
- C Nyquist 2014 History, current state, and community perceptions of the Área Silvestre Protegida Narganá and marine conservation in Isla Narganá, Isla Corazón de Jesús, and Isla Digir, Comarca Guna Yala – ISP paper. – optional reading relevant ISP
- Guarderas S, Hacker SD, and J Lubchenco 2008 Current status of marine protected areas in Latin America and the Caribbean. *Conservation Biology* 22:6, 1630-1640.

Assignment questions:

1. Solis Rivera et al. (2012). Discuss the findings in Guna Yala and Bocas del Toro. What are the common threads at the two sites? Please provide your opinions of the authors' recommendations. Substantiate and justify your arguments.
2. Hoehn and Thapa (2009). Do their conclusions reflect the data? What is your opinion of their extrapolations? Reflect on the data and offer your own conclusions. Read carefully.
3. Analyze the results of Christie et al. (2017) and Gill et al. (2017). When you bring their results together, what picture do their results paint regarding MPA management? What do you derive from them? Explain; be specific. Take these (their results and your analyses) and superimpose them on to Guna Yala (a self-designated protected area), do these ideas apply? If so, how? If not, why? Be sure to talk to people about your ideas and impressions. Resist assuming.
4. Discuss the findings from Apgar et al. Why study social resilience in the context of ecological conservation? Why is it necessary to ask "resilience for whom"? Please provide your perspective. *Bab Igar* provides insight into Guna spiritual belief systems; however, in some cases, it has been a barrier to the progress of environmental conservation in the Guna comarcas. Please discuss this situation and its impacts. Reference your interviews and other sources.

**Please note:** Please talk with four residents from Porvenir and neighboring islands. Integrate information from your discussions into your responses.

Date TBD Marine conservation and human livelihoods questions and oral presentation due

## Readings

Students are responsible for all of the required readings, and should be prepared to bring them to bear during program activities. The readings aim to help students place the classes in their context, to engage lecturers, to generate questions for class discussions, and to deepen students' knowledge of particular topics.