



MONKEYS, PARROTS, AND OTHER WILDLIFE IN THE FORESTS OF COSTA RICA



PLANNING CHECKLIST

PLANNING CHECKLIST

IMMEDIATELY

- Make sure you understand and agree to Earthwatch's **Terms and Conditions** and the **Participant Code of Conduct**.
- If you plan to purchase additional travel insurance, note that some policies require purchase at the time your expedition is booked.

6 MONTHS PRIOR TO EXPEDITION

- Log in at **earthwatch.org** to complete your participant forms.
- If traveling internationally, make sure your passport is current and, if necessary, obtain a visa for your destination country.
- Bring your level of fitness up to the standards required (see the Project Conditions section).

90 DAYS PRIOR TO EXPEDITION

- Pay any outstanding balance for your expedition.
- Book travel arrangements (see the Travel Planning section for details).
- Make sure you have all the necessary vaccinations for your project site.

60 DAYS PRIOR TO EXPEDITION

- Review the packing list to make sure you have all the clothing, personal supplies, and equipment needed.

30 DAYS PRIOR TO EXPEDITION

- Leave the Earthwatch 24-hour helpline number with a parent, relative, or friend.
- Leave copies of your photo ID and flight reservation number with a parent, relative, or friend.

READ THIS EXPEDITION BRIEFING THOROUGHLY. It provides the most accurate information available at the time of your Earthwatch scientist's project planning, and will likely answer any questions you have about the project. However, please also keep in mind that research requires improvisation, and you may need to be flexible. Research plans evolve in response to new findings, as well as to unpredictable factors such as weather, equipment failure, and travel challenges. To enjoy your expedition to the fullest, remember to expect the unexpected, be tolerant of repetitive tasks, and try to find humor in difficult situations. If there are any major changes in the research plan or field logistics, Earthwatch will make every effort to keep you well informed before you go into the field.

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NOTE FROM THE PI

DEAR EARTHWATCHER

With all of the environmental problems in the world today, it can sometimes seem like there are no real solutions, and like humans are always to blame. Yet humans are a part of the environment and have the potential to contribute to important ecological processes. When we understand that role, we can find points of “agreement” between humans and the natural environment, where the needs of both are in harmony.

Much of the welcoming, tropical country of Costa Rica is fragmented into a complicated mosaic of land cover, ownership, and land uses. Rural agricultural properties sit side by side with residences, small villages, and remnant native forests. The marks of human activities are everywhere: paths and roads crisscross the countryside, active and fallow fields dot the hillsides, and old and new houses interrupt the greenery.

This mosaic brings humans and other species into close proximity. Human land uses and behaviors may have myriad implications for the species living nearby. One way in which humans in the Coto Brus region may be contributing resources for other species is by planting fruiting trees on their properties. These plants may contribute ecosystem services by producing fruit and habitat for wildlife and serving as sources of seed for spontaneous forest regeneration in abandoned fields and roadsides. Our interdisciplinary research will work to understand the motivations behind the tree plantings as well as the importance of those plantings for regional wildlife and for the ecosystem service of seed dispersal.

Your help will be essential to this research! We need to observe and record which wildlife species (mainly birds, primates, and lizards) are visiting the trees and eating the fruits, and whether their behaviors are likely to lead to effective seed dispersal. To answer these questions, we need many people making careful, patient observations in order to catch glimpses of as much diversity of visiting wildlife as possible. Your participation will help us to understand how humans fit into the complex and vibrant mosaic of Coto Brus. We can't wait to have you on our research project!

Sincerely,

Dr. Kerry Grimm, Dr. Clare Aslan, and Dr. Sarah Frey
Principal Investigators





THE RESEARCH

MONKEYS, PARROTS, AND OTHER WILDLIFE IN THE FORESTS OF COSTA RICA



THE STORY

Over the past 70 years, more than three-quarters of the original tropical forest in Coto Brus, Costa Rica has disappeared (Malavasi and Kellenburg 2002). Today, this landscape is made up of mixed-use agricultural fields, some of which have been abandoned, while others are still in use for crops or cattle. These lands are interspersed with remaining forest reserves, which are teeming with wildlife – more than 2,000 plant species, 100 mammal species, and 400 species of birds occur in this region.

To regenerate, forests rely on vertebrates such as toucans, parrots, and other tropical birds, iguanas, and monkeys to consume and disperse seeds over long distances (Aslan et al. 2013). But ongoing habitat fragmentation and destruction are putting these species at risk and threatening biodiversity in Costa Rica.

In recent years, scientists working in Coto Brus have noticed something unusual. Local landowners are planting fruiting trees on their properties, which they intersperse among homes and agricultural fields across the landscape—although the specific reasons for this are not yet clear. Researchers hypothesize that these trees are supporting the re-growth and resilience of the forests by serving as seed sources and providing food and stopover points for seed dispersers.

By demonstrating the ecological benefits of these fruiting trees, Earthwatch teams could help to inform policies that support local communities, enabling landowners to continue or possibly scale up their tree-planting practices.

RESEARCH AIMS

This research will address the hypothesis that the planting of non-agricultural, fruiting trees by landowners in rural Costa Rica serves an important ecological and conservation function both by supporting seed dispersers and seed dispersal services across the region and by providing a seed source for forest regeneration following disturbance. Because much of Costa Rica's remaining forest is located on private land, it is important to understand private conservation and restoration efforts. The research will address the social hypothesis that landowners are aware of the ecological benefits of their planting practices and that this awareness contributes to their decision to plant such trees.

This research aims to provide ecological and societal benefits, in addition to facilitating a greater understanding of the ecological and socioeconomic impacts of planting trees in Coto Brus. By measuring seed dispersal within the focal landowner plantings, this study will extend these previous efforts by determining the ecological and conservation implications of an existing practice and the motivations underlying this practice.



HOW YOU WILL HELP

Volunteers will perform the following tasks:

- direct observation of frugivory (fruit-eating) in planted fruiting trees,
- collection of regurgitated, defecated and dropped seeds
- surveys for fruiting trees and seedlings/saplings
- collection of seeds from “fruit traps”
- examination of seeds under microscopes for intactness
- planting and tending of seed germination flats

DIRECT OBSERVATION OF FRUGIVORY IN PLANTED FRUITING TREES:

This will be the most common activity for volunteers. Volunteers will work in groups of two or more. The first full day of each volunteer session will involve training, with each group accompanying one of the project leaders to practice the methodology and identification. Thereafter, groups will perform at least one 3-hour observation per day. Two 3-hour observations may also occur in a particular day, but would be separated by a block of time spent on other activities to avoid observer fatigue. Observations will take place at various times throughout the day (start times may include 6:00 a.m., 9:00 a.m., 12:00 p.m., and 3:00 p.m.). Observations will consist of 10-minute blocks, with a 10-minute break every 50 minutes. During the observation, volunteers will record the animals (birds, mammals, and lizards) consuming fruits and seeds in the focal planted trees, the behaviors of those animals, and the total number of ripe fruits visible.

COLLECTION OF REGURGITATED AND DEFECCATED AND DROPPED SEEDS

During the break periods within the 3-hour observation, volunteers will collect seeds that they observed being regurgitated, dropped, or defecated by frugivores. They will use surgical gloves to avoid direct contact. Any collected seeds will be placed in small coin envelopes and labeled with the fruiting plant and the frugivore observed dropping the seed.

SURVEYS FOR FRUITING TREES

Once per month, volunteers will assist the project leaders in walking the perimeter of the focal study sites and the concentric paths surrounding that perimeter to survey for fruiting trees out to 200 m in all directions beyond each focal stand. The teams will record the species of each fruiting tree as well as the date and condition of the tree. Sometimes these same surveys will include data collection on occurrence of seedlings and saplings of the intentionally planted tree species. These surveys will be performed by one of the project leaders working directly with volunteers, since identification of trees at seedling/sapling stages can be challenging. For this task, volunteers will not need to perfect their plant identification skills, but will instead assist with data recording and initial spotting of new seedlings.

COLLECTION OF SEEDS FROM SEED TRAPS

In 2018, the first year of the project, the early teams (likely teams 1 and 2) will assist in assembling and deploying seed traps. Later volunteer teams will collect seeds that have fallen into seed traps. All seeds from a given trap will be placed in a paper bag and labeled with the trap number (in order to keep track of its location relative). The seeds will later be sorted by species, and volunteers may assist with the sorting, grouping seeds by similar appearance.

EXAMINATION OF SEEDS UNDER MICROSCOPES

Seeds that have been collected from the ground beneath the trees, as well as those that have been collected from fruit traps, must be examined for intactness. This will be done under a microscope, the degree of seed intactness recorded on a datasheet, and seeds that are visibly intact sorted into a separate container for planting in germination flats. Using example photographs, volunteers will be trained in the appearance of an intact seed for each focal species as well as the appearance of seeds that have sustained minor, medium, and major damage, so that they can assign an intactness category to each seed.

PLANTING AND TENDING OF SEED GERMINATION FLATS

Seeds that are deemed intact or have minor or medium damage will be scattered across the surface of germination flats and watered. All seeds in a given flat will be from a single species and fit a single category of intactness. Flats will be labeled with that species and the date of planting. Following planting, flats will be watered three times per week and the number of germinants recorded each day. Volunteers will assist with germination data collection, planting, and watering.

SOCIAL SCIENCE DATA COLLECTION

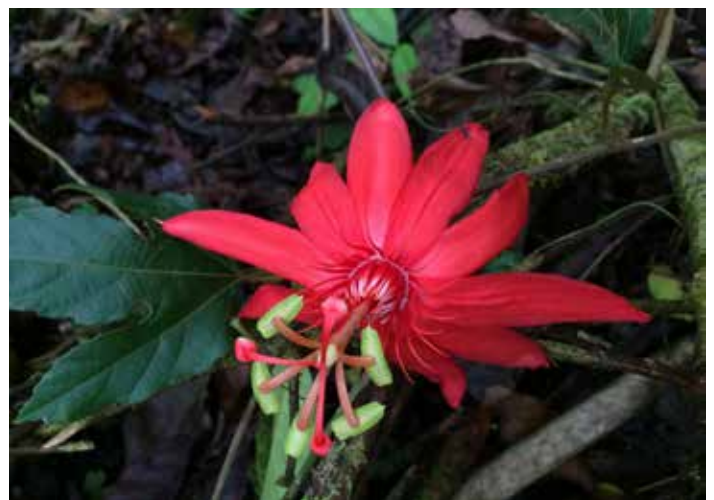
The majority of the work with which citizen scientists will be involved is collecting the ecological data discussed above. The social science data collection requires Spanish proficiency, experience interviewing, and Institutional Review Board (IRB) approval. IRB prohibits engagement in the data collection by volunteers because they have not gone through IRB training or received approval. However, if volunteers are interested in gaining experience in this part of research, they may be able to observe landowner discussions of non-agricultural tree planting in community meetings, since these are public forums.

DAILY LIFE IN THE FIELD

PLANS FOR YOUR TEAM



Typical research days may vary somewhat. The first day will be spent in training and a day in the middle of the session will be a recreational/rest day for volunteers. Project staff will suggest activities volunteers may choose to do on this day to further experience the region. Remaining days will contain a variety of field tasks. The typical day described here may vary somewhat as some tasks need to be performed only once per month at each site (e.g., seed trap checks, fruiting tree surveys) and others may be performed depending on the number of volunteers and their energy level (e.g., a second observation set in a day). Early morning and late afternoon observations are important because those are peak times for bird activity, but some volunteer groups may be unable to work at those times and will be accommodated. Every day will contain free time for the volunteers.



DAILY ACTIVITIES

This is just an example of how a day in the field may unfold, but every day will be a little different. Weather and research needs can lead to changes in the daily schedule. We appreciate your cooperation and understanding.

DAILY SCHEDULE

6:30 a.m.	breakfast (may be taken as "sack lunch"-style to allow early morning observations; thus, departure for field site could occur at 5:30 a.m.)
7:30 a.m.	depart for field site
8:00 a.m.	collect dropped seeds; check fruit traps; walk perimeter, etc.
9:00 a.m.	frugivory observation
12:00 p.m.	return to field station
12:30 p.m.	lunch
1:30 p.m.	data entry
2:30 p.m.	flat planting and maintenance and data entry
3:30 p.m.	free time / meet with project staff to ask questions and go over data
6:00 p.m.	dinner



ACCOMMODATIONS AND FOOD

ABOUT YOUR HOME IN THE FIELD



Las Cruces Biological Station is a very comfortable field station. In addition to providing housing for researchers (short and long-term), Las Cruces also receives Natural History Visitors (i.e. ecotourists). Given this, the station is able to provide many amenities.

SLEEPING

The quarters in which the volunteers stay will depend on the size of the group and room availability. The Wilson House will be used for student groups and teen teams, as it provides sleeping and classroom space, as well as a wonderfully sunny common room in a spacious building located in the center of the botanical gardens. Wilson House accommodations have ample shared bathrooms, with several toilet and shower stalls. The cabins for all other teams include twin and bunk beds accommodating up to three people per bedroom. They also have private baths and balconies. For comfort, rooms have fans, and windows have either screens or glass. Towels and bedding (e.g., sheets, pillows, blankets) are provided.

The number of participants per room will vary depending on the specific quarters the team is assigned and room availability. Single and couples rooms can be requested, but whether that request can be accommodated will depend on availability during each team (and will likely require payment of a private room supplement, approximately \$100 per person).

BATHROOMS

There are hot showers at Las Cruces Biological Station. There is also conventional sanitation, and as noted above, rooms have private baths. Toilet paper is not flushed down the toilet due to the type of septic systems they use in Costa Rica. Instead it is deposited in the small trash bin next to the toilet.

ELECTRICITY

There is electricity in all the rooms throughout the station. You are welcome to bring electrical equipment. Electrical outlets in Costa Rica are 110v just like in North America. However, although most wall outlets are being switched to 3 prongs, if your device uses a 3-prong plug, we recommend bringing an adapter that converts from 3 to 2 prongs. Power in the rainforest can be unreliable, so come prepared for outages.



PERSONAL COMMUNICATIONS

All buildings, including bedrooms, have wifi access that is free and available 24/7. You may bring your own laptop, tablet, or smartphone for free-time use.

Please note that personal communication with outsiders is not always possible while participating in an expedition. Earthwatch encourages volunteers to minimize outgoing calls and immerse themselves in the experience; likewise, family and friends should restrict calls to urgent messages only.

FACILITIES AND AMENITIES

The project home base is a field education and research station operated by the Organization for Tropical Studies. There are labs, classroom space, and various accommodations to support researchers and students. These may also be in use by other groups when your Earthwatch team is present.

Laundry service is available for a fee of \$10 USD per bag. Plan to leave up 16 hours for your laundry to be washed, dried and available for pick-up.

There are limited shopping opportunities nearby. Several small grocery stores are located in San Vito, which is ~4 miles from the field station and is reachable by bus or a long walk. Since it would not be possible to make this trip very often, and as items typically available in US grocery stores may not be available in Costa Rican grocery stores, if there is something that you like to have every day, we recommend that you bring it with you. There is a small craft shop nearby that teams can visit for souvenir opportunities.



FOOD AND WATER

Las Cruces Biological Station provides family-style meals, served at 6:30 a.m., 12:00 p.m., and 6:00 p.m. When teams are performing early morning observations (beginning at 6:00 a.m.) or working in a more distant observation site or performing plant surveys after observations that make it impossible to get back for lunchtime, volunteers will be provided with box lunches and/or breakfasts prepared by kitchen. There is also an area with coffee and tea available throughout the day. Given that Las Cruces has a dedicated kitchen and staff to make meals, volunteers and research staff will not be involved in any cooking, shopping, or cleaning up—other than bussing their dishes.

The kitchen has refrigeration, and refrigeration is also available in some of the cabins.

Water from all taps at Las Cruces is spring-sourced and safe to drink.

The following are examples of foods you may encounter during this experience. Variety depends on availability. We appreciate your flexibility.

TYPICAL MEALS

BREAKFAST	Gallo pinto (rice and beans), eggs, toast, pancakes/arepas, cheese, plantains, fresh fruit, coffee
LUNCH	Sandwich bag lunch with peanut butter & jelly, or lunch meat and cheese options plus juice, cookies (they have multiple to-go lunch options)
DINNER	Chicken, beef or fish option, plus steamed vegetables and rice, beans, tortillas or pasta
DESSERT (often served with lunch)	Tres leches cakes, and other pastries, fruit, rice pudding
BEVERAGES	Fresh juice, water, coffee, hot chocolate

SPECIAL DIETARY REQUIREMENTS

Please alert Earthwatch to any special dietary requirements (e.g., diabetes, lactose intolerance, nut or other food allergies, vegetarian or vegan diets) as soon as possible, and note them in the space provided on your volunteer forms.

Las Cruces can provide meals for vegetarians, vegans, lactose intolerance, gluten-free, and other restrictions. They are used to accommodating diets of researchers and travelers from all over the world. Food allergies or dietary/restrictions should be reported in advance and the kitchen will plan meals that accommodate those requests.

PROJECT CONDITIONS

THE FIELD ENVIRONMENT

Costa Rica is known worldwide for its abundant tropical wildlife, friendly people, and pleasant climate. It is known as a fairly easy country to travel to and explore, with infrastructure and laws that are in better shape than most tropical countries. This study involves direct observation of tropical species including birds (toucans, trogons, parrots, tanagers), primates (white-faced capuchins), and reptiles (iguanas). These animals are highly charismatic and will be attractive to participants. Other animals volunteers may see in Costa Rica, during research or recreational outings, include additional attractive bird species (motmots, quetzals), snakes and crocodiles, coatis, kinkajous, jaguarundi, spider monkeys, squirrel monkeys, howler monkeys, sloths, macaws, hummingbirds, and butterflies.

The climate is tropical, with warm temperatures year-round (average 23°C), although due to the station's elevation, it can be cool at night. Rain and storms are possible at any time (annual rainfall of 3.5-4m), but there is a drier season in January-March. Even during the rainy season, rainfall has a certain pattern (e.g., afternoon) and it will not usually rain all day.



GENERAL CONDITIONS

The following are averages. Please check weather resources for your team dates for more accurate weather predictions. Projects have experienced unseasonable weather at all times of year.

HUMIDITY: 63-83%

AVERAGE TEMPERATURE: 21-23°C (70-74°F)

RAINFALL:

Jan-Mar: 50-90 mm/mo

Apr-Aug: 200-400 mm/mo

ESSENTIAL ELIGIBILITY REQUIREMENTS:

All participants must be able to:

- Follow verbal and/or visual instructions independently or with the assistance of a companion.
- Enjoy being outdoors all day in all types of weather, including rain, heat, and humidity, in the potential presence of insects, snakes (rarely), and other wild animals. Field work WILL continue in rainy conditions.
- Walk slowly up to 3 miles total per day, along pre-established paths that may be muddy or uneven due to tree roots or through cow pastures, searching for fruiting plants and seedlings.
- Stand for periods of about 3 hours while observing frugivore activity (small stools may be available to assist with this).
- Get low enough to the ground to collect fallen seeds and sometimes to crawl under fence wires.
- Carry personal daily supplies such as lunch, water, and some small field equipment.
- Get themselves up into and down out of a four-wheel-drive vehicle, minibus, or car and ride for up to 1.5 hours at a stretch, seated with seat belt fastened.



POTENTIAL HAZARDS

MONKEYS, PARROTS, AND OTHER WILDLIFE IN THE FORESTS OF COSTA RICA

HAZARD TYPE	ASSOCIATED RISKS AND PRECAUTIONS
Transportation	<p>We may encounter poor road conditions including landslides. Only qualified, experienced drivers will transport volunteers in project vehicles; we ensure project vehicles are well maintained. Seatbelts must be worn at all times. Volunteers are not permitted to drive. Driving after dark will be avoided, except in cases of emergency. Drivers and project staff will: stay abreast of local road conditions in order to avoid driving in inclement weather or on compromised routes; maintain appropriate distance between vehicles and travel at safe speeds (particularly on unpaved roads), carry cell phone and emergency equipment, such as GPS unit, first aid kit and water, spare tire and jack, in case of accident/break down on road.</p>
Hiking	<p>You'll likely traverse uneven terrain and hike uphill in humid tropical conditions; there's a risk of sprains, strains, bruises or breaks due to falling or tripping. You should never walk ahead of your team leader, and should follow the leader's instructions. Wear appropriate footwear (hiking boots with ankle support or high rubber/wellington boots with good tread) while hiking. Participants should take regular breaks, avoid overexerting themselves, use a walking stick or hiking pole if needed, only hike on terrain they are confident they can navigate safely and to inform a staff member if feeling tired or ill.</p> <p>All scheduled fieldwork is planned on land the teams have permission to access, in partnership with the landowners. Sometimes a landowner may not be able to unlock a gate or meet the team at a specific time, and so access to a property may sometimes require ducking under or over a strand of barbed wire, or navigating a gap in the fence line. Be assured that these are not instances of trespassing or unplanned access.</p>
Animals and Plants	<p>Venomous snakes are present in the area but are more common in the forest than in the open research sites. Team members should: wear tall rubber boots or snake guards in the field, always look before stepping, and under no circumstances attempt to handle snakes.</p> <p>Pumas and jaguars tend to avoid humans and attacks are extremely rare. If a large cat has been sighted near a field site, teams will focus on plots in different locations. Large cats tend to be most active at dawn and dusk; teams will be extra cautious during these times and ensure that volunteers and staff make noise as they arrive and begin an observation, so that no cats will be startled. All plant surveys will take place midday, when cats are least active. Being in a group also decreases the chances of encountering large cats.</p> <p>You'll likely encounter many insects in the field; wear long-sleeved shirts and long pants and apply insect repellent frequently to avoid bites. Those with insect allergies should bring the proper emergency treatment (such as an Epi-Pen, with spares) and inform staff of the problem and the location of the treatment; they should take special precautions while collecting field data.</p> <p>While hiking, we may encounter plants with irritating spines or sap. These plants are easy to avoid by not reaching out or touching plants while hiking.</p>
Climate/ Weather	<p>Dehydration, heat exhaustion, sunburn, and other heat-related illnesses can occur, but you can protect yourself by drinking sufficient water, wearing high-SPF sunscreen, and wearing appropriate clothing. Dehydration from sweating can be a problem; please bring your own water bottles that you can easily carry and refill. Staff will attempt to stay in the shade and leave strenuous tasks until cooler times of day whenever possible. Participants should exercise these precautions even in cooler temperatures and/or when the sky is overcast. Teams will have appropriate materials in First Aid kits (sunscreen, rehydration salts, etc.), and always have kits readily available in the field and at the research station.</p> <p>In instances of adverse weather events, project staff will be responsible for monitoring weather forecasts and changing weather in the field, and determining site location and travel route for the day to minimize exposure to adverse weather. This will include contingency plans if weather changes unexpectedly. In the event of unexpected severe storms, teams will seek shelter in a station building or other stable structure, and avoid trees.</p>
Personal Security	<p>Participants should take standard precautions such as storing their passport and money properly at the research sites and en route, not traveling or walking around alone (especially after dark), avoiding wearing expensive jewelry and flashing money or electronics, leaving unnecessary valuables at home, and guarding against pickpockets, particularly when travelling out to the project, and in urban centers during recreational time or before/after the team.</p>
Travelers' Diarrhea	<p>Meals will be prepared by research station staff, experienced in safe food handling. Field staff will ensure good hygiene practices are maintained at the research station and during field work. Ample potable safe water will be provided (water from the taps at Las Cruces is good for drinking). Participants should always wash their hands with soap and water or a hand sanitizer before eating, and drink filtered or bottled water. Also, prior to travel, participants should speak to their doctor about other options for treating travelers' diarrhea.</p>
Distance from Medical Care	<p>It may take an hour to reach the nearest hospital or more to arrange transport and reach the hospital. If you have a chronic condition which could require immediate medical care (e.g., heart conditions, kidney problems, severe asthma, etc.), or if you are pregnant, please discuss your participation on this expedition with your physician.</p>



HEALTH & SAFETY

MONKEYS, PARROTS, AND OTHER WILDLIFE IN THE FORESTS OF COSTA RICA



EMERGENCIES IN THE FIELD

Project staff members are not medical professionals.

The project will have cell phones and two-way radios for communication among the team while conducting field work. If an emergency occurs during field work, the volunteer team should immediately use those methods to contact the project leader on duty, who will respond to the emergency, transporting the volunteer team back to Las Cruces or to the hospital or police station in San Vito, as appropriate.

In addition, for emergency assistance in the field, please contact Earthwatch's 24-hour emergency hotline number on the last page of this briefing. Earthwatch is available to assist you 24 hours a day, 7 days a week; someone is always on call to respond to messages that come into our live answering service.

IMMUNIZATIONS & TRAVEL VACCINATIONS

Please be sure your routine immunizations are up-to-date (for example: diphtheria, pertussis, tetanus, polio, measles, mumps, rubella and varicella) and you have the appropriate vaccinations for your travel destination. Medical decisions are the responsibility of each volunteer and his or her doctor, and the following are recommendations only. Visit cdc.gov or who.int for guidance on immunizations.

If you are traveling from countries or regions where yellow fever is endemic, you must have a certificate of vaccination.



TRAVEL TIPS

SUGGESTIONS FOR THE ROAD

YOUR DESTINATION

LANGUAGE: Spanish. In San José and other cities and at the field station, many people speak some English. The project will be conducted in English.

TIME ZONE: GMT/UTC -6.

CULTURAL CONSIDERATIONS: The dominant religion in Costa Rica is Catholicism. Volunteers may be present during certain important religious and cultural holidays, such as Semana Santa (Holy Week), which is celebrated as a national holiday and a time for most Costa Ricans to take vacations.

Casual, modest dress is acceptable nearly everywhere in Costa Rica.

A 10% tip is already included in all restaurant bills, and Costa Ricans generally do not tip above and beyond this except for exceptional service. Wait staff are more accustomed to receiving an extra tip from tourists who are unfamiliar with the service tax included in the bill. Tipping taxi drivers, airport curbside baggage handlers, and hotel bellhops is customary.

LOCAL CURRENCY: Costa Rican Colónes (CRC). U.S. Dollars are also often accepted. The approximate conversion rate is 500 colones to 1 U.S. Dollar. An ATM will not be accessible during research days or field station days. Credit cards are accepted in most of the country. It is wise to alert your credit card company to your travels ahead of time so they do not impose a hold on your card as a security measure.

COUNTRY AND PROJECT ENTRY REQUIREMENTS

Entry visa requirements differ by country of origin, layover, and destination, and do change unexpectedly. For this reason, please confirm your visa requirements at the time of booking and, again, 90 days prior to travel. Please apply early for your visa (we recommend starting 6 months prior to the start of your expedition). Refunds will not be made for volunteers cancelling due to not obtaining their visa in time to meet the team at the rendezvous. You can find up to date visa requirements via one of the following sites:

www.passportsandvisas.com
www.travisa.com

If a visa is required, participants should apply for a TOURIST visa. Please note that obtaining a visa can take weeks or even months. We strongly recommend using a visa agency, which can both expedite and simplify the process.

Generally, passports must be valid for at least six months from the date of entry and a return ticket is required.

You must keep the immigration card issued to you upon arrival in Costa Rica! Visitors are advised to keep it with their travel documents as you will be required to present it to an Immigration Officer upon your departure.

CONTACT INFORMATION

You may be required to list the following contact information on your visa application and immigration form, or if your luggage does not make it to baggage claim at your destination:

Rebecca Cole
Station Director
Las Cruces Biological Station
6 km SE, from San Vito to Neilly, Ruta 237
San Vito 60801, Costa Rica
(506) 2773-4004



EXPEDITION PACKING CHECKLIST

WHAT TO BRING

EXPEDITION PACKING CHECKLIST

GENERAL

- This expedition briefing
- Your travel plans, rendezvous details, and Earthwatch's emergency contact information
- Photocopies of your passport, flight itinerary, and credit cards in case the originals are lost or stolen; the copies should be packed separately from the original documents
- Passport and/or visa (if necessary)
- Certification of vaccination (if necessary)
- Documentation for travel by minors (if necessary)

CLOTHING/FOOTWEAR FOR FIELDWORK

ALL TEAMS:

- Earthwatch T-shirt
- 2–3 lightweight, quick-drying, button-down long-sleeved shirts
- 2–3 pairs of quick-drying long pants
- Wide-brimmed sun hat or baseball hat
- Lightweight raincoat or poncho
- 4–5 pair of thick hiking socks (wool or synthetic—NOT cotton)
- Bandana
- Hiking boots with ankle support OR knee-high rubber boots with good tread
- Gardening gloves (Optional, for greenhouse work)
- Snake chaps (Optional)

CLOTHING/FOOTWEAR FOR LEISURE

- At least one set of clothing to keep clean for end of expedition
- Light-weight pants (jeans are not the best, once they get wet they will not dry before you leave)
- Shorts
- T-shirts / tank tops
- Sweatshirt / light jacket
- Tennis shoes / casual shoes (Closed-toe shoes are recommended around the research station after dark)
- Sandals (preferably ones that can get wet)

FIELD SUPPLIES

- Binoculars
- Daypack to carry and keep your personal items together and dry
- Sunscreen lotion with SPF 45
- Lip balm with sunscreen
- Field notebook and pencils
- 2 one-liter water bottles, OR 1 two-liter water bottle or reservoir
- Insect repellent
- Sunglasses

BEDDING AND BATHING

NOTE: all bedding (sheets, blankets, pillow and case), as well as bath towels and hand towels, is provided at the research station.

PERSONAL SUPPLIES

- Personal toiletries (biodegradable soaps and shampoos are encouraged)
- Antibacterial wipes or lotion (good for cleaning hands while in the field)
- Personal first aid kit (e.g., anti-diarrhea pills, antibiotics, antiseptic, itch-relief, pain reliever, bandages, blister covers, etc.) and medications
- Baby powder (recommended by field staff to relieve chafing in the hot, humid environment)
- Small Bottle of Aloe Vera or equivalent skin calming cream (good for bug bites and sunburn)
- Spending money
- Flashlight or headlamp with rechargeable batteries (don't forget your charger!)
- Chargers for your electronics



EXPEDITION PACKING CHECKLIST

OPTIONAL ITEMS

- Flip flops or sandals for the shower
- Camera, film or memory card(s), extra camera battery
- Hardware for sharing digital photographs at the end of the expedition
- Dry bag or plastic sealable bags (e.g. Ziploc) to protect equipment like cameras from dust, humidity, and water
- Books, games, art supplies, etc. for free time
- Earplugs for light sleepers
- Journal

NOTE: Do not bring more luggage than you can carry and handle on your own. If traveling by air and checking your luggage, we advise you to pack an extra set of field clothing and personal essentials in your carry-on bag in case your luggage is lost or delayed. Be sure to check any baggage restrictions imposed by your airline carrier. If arriving by air to Golfito, you will likely use Sansa or Nature Air, which allow each passenger one checked bag between 15 and 40 pounds (depending on fare class purchased) and one carry-on luggage not exceeding 10 lbs. If your luggage is overweight you may be charged or it may be put on a later flight



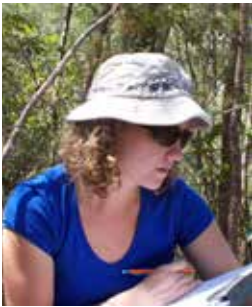
PROJECT STAFF

YOUR RESOURCES IN THE FIELD



NOTE: Because the PIs all have young children, it is possible that they will have family members accompanying them from time to time. The specific staff scheduled to run your team is subject to change.

DR KERRY GRIMM, Principal Investigator, is a lecturer at Northern Arizona University. She received her Ph.D. in Environmental Science from Oregon State University. Her dissertation focused on conservation volunteer tourism at a biological reserve in Ecuador's cloud forest. Specially, she examined volunteer motivations and preferences, as well as different interpretations of "conservation" and how that influenced interactions both among volunteers and with project staff. As a social scientist with a background in ecology, Dr. Grimm seeks to understand human-environment interactions through the use of interviews and surveys. She is interested in exploring individuals' perceptions and actions towards the environment, as well as how humans interact with each other when it comes to environmental issues. Her research has primarily focused on (1) private conservation efforts in Central and South America and (2) collaboration efforts on fire and forest restoration in the Western United States. **Dr. Grimm will be present to lead teams 1 and 3.**



DR CLARE ASLAN, Principal Investigator, is an assistant professor at Northern Arizona University. She received her PhD from the University of California, Davis, where she spent years watching birds in trees and trying to understand the complex interactions that support diversity on Earth. Her research is focused on the effect of global change on interactions between species. She teaches ecology at NAU. She lives in Flagstaff, Arizona, with her husband and two children. In addition, Dr. Aslan was a Peace Corps Volunteer in Honduras from 2001-2004, serving in the sparsely-settled eastern ranching region of the country. There, she lived and worked in the gateway community for a cloud forest national park, helping park personnel to census wildlife species and construct a visitor's center. In addition to studying seed dispersal in Costa Rica, Dr. Aslan researches pollination in Hawaii and the Grand Canyon, as well as collaborative management in and around protected areas across the US. **Dr. Aslan will be present to lead teams 1 and 4.**



DR SARAH FREY, Principal Investigator, is a Postdoctoral Scholar in the Department of Forest Ecosystems & Society at Oregon State University. She completed her PhD in Forest Science at OSU studying how microclimate and vegetation structure influence bird distributions in the Cascade Mountains of Oregon. She did her master's work at the University of Vermont on the importance of spatial scale on habitat use of a high-elevation specialist bird. Between her undergraduate and master's degree she spent five years doing fieldwork all over the Americas from southern Argentina, to Ecuador, to Arizona, to Hawaii. She has worked in Costa Rica at the Las Cruces Biological Station since 2010 (usually staying 3 months per year) studying how forest fragmentation influences hummingbird pollination. She continues research in Oregon studying how alpine meadow configuration influence rufous hummingbird movements and how bird distributions will respond to climate change in montane environments. **Dr. Frey will be present to lead team 2.**



MAURICIO PANIAGUA CASTRO (Mau for short), is a local researcher at Las Cruces Biological Station who has worked on the Oregon State University hummingbird project since 2010. Prior to that he assisted with other ecological field projects at Las Cruces starting around 2004. He was born and raised in San Vito in a large family (10 siblings) and has extensive knowledge of the local area and community. In addition to knowing the area around Las Cruces well, he is also a very gifted field ecologist and observer.





ROBYN BATH-ROSENFELD, Field Team Leader, is a graduate student at Northern Arizona University studying for a degree in Environmental Science & Policy. She received her Bachelors in Science from the University of Vermont in Environmental Studies. Her undergraduate thesis focused on the communication of goals in volunteer ecotourism. After Vermont, she served in Trinidad & Tobago as a Princeton in Latin America Fellow where her interest turned towards field ecology and conservation biology. She has spent the last few years studying these dynamics in Jamaica, Ecuador, Wyoming, and coastal Oregon. In Costa Rica, Robyn will be focusing her thesis research on the dynamics of seed dispersal and how it affects local frugivores. **Robyn will be present to lead teams 2, 5, 6, 7, 8, and 9.**



JOHN LEARY, Field Team Leader, is working towards his MS degree in Environmental Science and Policy at Northern Arizona University. After finishing his bachelor's degree in Geography and Spanish he worked on riparian restoration and recreation management projects throughout Arizona and Montana. In between he taught English in Spain for 2 years and spent a year volunteering and traveling in Central America. He loves spending time outdoors and meeting new people. He has been Wilderness First Responder and CPR certified for over three years. **John will be present to lead teams 2, 5, 6, 7, 8, and 9.**



CAITLIN WINTERBOTTOM, Field Team Leader, is in her second year of her Masters in Environmental Science & Policy under the guidance of Dr. Clare Aslan, at Northern Arizona University in Flagstaff, Arizona. She received her undergraduate degree in Botany at Humboldt State University in beautiful Northern California. She has spent most of her career studying mutualistic relationships, whether that be in Guyana, South America discovering symbiotic fungi or in the Rocky Mountains looking at nectar robbing behavior of bumblebees, her passion for community ecology reigns true. For her Masters research, she is looking at the above-and-below-ground interactions of Sonoran Desert wildflowers and how that can better inform pollinator restoration projects. **Caitlin is currently planning on joining the student group teams** (this schedule is tentative).

An **EARTHWATCH TEEN TEAM FACILITATOR** (TEEN team only) will accompany the teen team from the time you step off the plane for the rendezvous until the end of the expedition. If you have any questions or problems, such as issues with another volunteer, homesickness, or an emergency back home, please talk to your facilitator. Follow your facilitator's advice on safety and personal conduct. All facilitators have experience teaching and leading groups of teenagers. Remember, your facilitator is there for you. (Teen: Facilitator ratio is approx. 6:1)



RECOMMENDED READING

YOUR RESOURCES AT HOME

RESOURCES

ARTICLES

- Brodie, J. F., C. E. Aslan, H. S. Rogers, K. H. Redford, J. L. Maron, J. L. Bronstein, and C. R. Groves. 2014. Secondary extinctions of biodiversity. *Trends in Ecology and the Environment* DOI: <http://dx.doi.org/10.1016/j.tree.2014.09.012>.
- Brodie, J. F., and C. E. Aslan. 2012. Halting regime shifts in floristically intact tropical forests deprived of their frugivores. *Restoration Ecology* 20:153-157.
- Aslan, C. E. 2011. Implications of newly-formed seed dispersal mutualisms between birds and introduced plants in northern California, USA. *Biological Invasions* 13:2829-2845.
- Grimm, K. E. 2013. Doing 'conservation': Effects of different interpretations at an Ecuadorian volunteer tourism project. *Conservation and Society*, 11(3): 264-276. <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2013;volume=11;issue=3;page=264;epage=276;aulast=Grimm;type=0>

BOOKS

- Lonely Planet Guide to Costa Rica
- The Rough Guide to Costa Rica
- Frommer's Guide to Costa Rica
- A Guide to the Birds of Costa Rica, by F. Gary Stiles
- A Bird Watcher's Adventures in Tropical America by Alexander F. Skutch

- The Natural History of Costa Rican Mammals, by Mark Wainwright
- Costa Rican Natural History by Daniel H. Janzen
- A Neotropical Companion: An Introduction to the Animals, Plants and Ecosystems of the New World Tropics by John C. Kricher

PROJECT-RELATED WEBSITES

- **LAS CRUCES BIOLOGICAL STATION:** http://www.ots.ac.cr/index.php?option=com_content&task=view&id=220&Itemid=422
- Lists of species found at Las Cruces can be found here: http://www.tropicalstudies.org/index.php?option=com_content&task=view&id=226&Itemid=429&lang=en
- **COSTA RICA WILDLIFE (WIKIPEDIA):** https://en.wikipedia.org/wiki/Wildlife_of_Costa_Rica
- **COSTA RICA TRAVEL (NATIONAL GEOGRAPHIC):** <http://travel.nationalgeographic.com/travel/countries/costa-rica-guide/>
- **COSTA RICA TRAVEL (LONELY PLANET):** <https://www.lonelyplanet.com/costa-rica>

EARTHWATCH SOCIAL MEDIA

- **FACEBOOK:** [facebook.com/Earthwatch](https://www.facebook.com/Earthwatch)
- **TWITTER:** twitter.com/earthwatch_org
- **INSTAGRAM:** [instagram.com/earthwatch](https://www.instagram.com/earthwatch)
- **BLOG:** blog.earthwatch.org/
- **YOUTUBE:** [youtube.com/earthwatchinstitute](https://www.youtube.com/earthwatchinstitute)

LITERATURE CITED

LITERATURE CITED

- Aslan CE, Zavaleta ES, Tershy B, Croll D. 2013. Mutualism disruption threatens global plant biodiversity: a systematic review. *PLOS ONE* 8:e66993.
- Malavasi EO, Kellenberg J. 2002. Program of payments for ecological services in Costa Rica. Building Assets for People and Nature: International Expert Meeting on Forest Landscape Restoration, Heredia, Costa Rica 27:1-8.



EMERGENCY NUMBERS

AROUND-THE-CLOCK SUPPORT



MESSAGE FROM EARTHWATCH

DEAR EARTHWATCHER,


Thank you for joining this expedition! We greatly appreciate your decision to contribute to hands-on environmental science and conservation. It is volunteers like you who fuel our mission and inspire our work.

While at Earthwatch, I've had the opportunity to field on a few expeditions, most recently in Kenya with one of my daughters. Each expedition has touched me deeply, and made me proud to be able to roll up my sleeves alongside my fellow volunteers and contribute to such meaningful work.

As an Earthwatch volunteer, you have the opportunity to create positive change. And while you're out in the field working toward that change, we are committed to caring for your safety. Although risk is an inherent part of the environments in which we work, we've been providing volunteer field experiences with careful risk management and diligent planning for nearly 45 years. You're in good hands.

If you have questions as you prepare for your expedition, we encourage you to contact your Earthwatch office. Thank you for your support, and enjoy your expedition!

Sincerely,



Scott Kania
President and CEO, Earthwatch





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