

SEB STUDENT ROUNDTABLE
ICE JUNE 2004

USEFUL INFORMATION¹ FOR STUDENT ECONOMIC BOTANISTS

A. FIELD EQUIPMENT

1. Catalogues

- Real Goods (www.realgoods.com)
- www.REIoutlet.com
- Camp-Mor (www.campmor.com; 1-800-226-7667)
- Forestry Suppliers (1-800-647-5368; www.forestry-suppliers.com)
- Cabela's (www.cabelas.com; 1-800-237-4444)
- Cases For Less (www.cases4less.com)
- Ben Meadows (www.benmeadows.com)

2. Solar power systems

- Flexible photovoltaics are easier to transport (you can roll them up!) but are less durable
- You'll also need to buy a battery and inverter (at least)
- The folks at Real Goods (see above) have information on their web site and also make helpful suggestions, especially in calculating the photovoltaic size necessary to power your equipment
- One recommendation for MorningStar SunSaver-6 solar charge controller
12 V battery and AA car battery charger from Radio Shack
- One recommendation for Double-Size Multipower Source (from Real Goods), has a handy, flexible-necked lamp that attaches

3. Binoculars

- There is something of a trade-off between size and quality of image, although some of the better compact binocs sacrifice very little. One recommendation for a 1:4 ratio between magnification/power and exit pupil (the two numbers provided for all binocs).
- One recommendation for Nikon 8 x 30 armor-plated binoculars; not compact but durable
- One recommendation for 8 x 22 Leitz Trinovid binocs; compact, good light, durable
- Lenses will mold with high humidity use if not cared for

4. Humidity and wet conditions

- Zip-Loc type bags. Be sure to use at least 2 bags!
- Lexan plastic boxes are airtight and extremely durable; great for storing first aid supplies, batteries, anything that can't get wet. GSI, Pelican boxes and Otter boxes are three brands.

¹ Many thanks to the New York Botanical Gardens curators and students for allowing us to use information from their 'Botanist Toolkit' recommendations. Thanks also to the SEB Student Committee and student contributors who sent in information. We apologize for the U.S. bias, this is simply a result of those who offered suggestions.

- Pelican makes a shock-resistant, waterproof box for computers.
- Ortlieb (www.ortliebusa.com) makes waterproof bags, backpacks, and panniers.
- Indicator silica gel is more expensive than non-indicator but more certain; it can be heated (re-dried) a number of times (www.desiccare.com; www.desiccantcity.com). Cases For Less also sells small metal-enclosed packets of silica gel. Note: all silica gel is considered hazardous waste, however cobalt from indicating silica gel may leach into runoff or groundwater.
- In a pinch, you can use rice as a moisture absorber, replacing it frequently.
- Dry bags (vinyl bags you roll up and clip) are reliable but can be heavy and can heat up.
- Dry bags with a waist strap are very handy for cameras, GPS, etc. and can be found at most outdoor and water sports stores.

5. Digital cameras

- The Nikon 800 series now runs about \$500; the Cool Pix 880 has a good macro function and is very compact. Keep in mind that there will be additional costs: memory chips, the USB cable for downloading to your computer (not always provided), battery recharger and rechargeable batteries, lens attachments, case, etc.
- The 900 series starts around \$700; the advantage of these is that some models can actually screw on to a microscope objective; you need to check this feature for the 'scope you use before buying.
- Check megapixel size for the resolution you want
- Check storage medium
- Most digital cameras cannot use additional lenses. Yet lenses may be quite useful, for example for light measurements using a hemispheric (or fish-eye) lens.

6. SLR cameras

- Highly electronic cameras are more likely to short-circuit in high humidity; One recommendation for Pentax K-1000 and one for Konica T3. The former is relatively lightweight
- Bring extra batteries!

7. Water bottles

- A number of participants use Nalgene plastic jars. The softer plastic is less brittle but tastes more like plastic and absorbs any flavors added, while the harder plastic has no plastic taste but is more brittle. Many waterpumps screw into these water bottles.
- One recommendation for a Reliance plastic canteen with canvas cover to help keep liquids cool (if the canvas is moistened). Another recommendation for a French enameled canteen with a clip top; it is indestructible and absolutely leak-proof.

8. Tree climbing equipment

- 50m of 10 mm climbing rope with single rope technique using a Petzl ascender and Croll, Petzl descender, Safety rope, Petzl harness, throw bag and line, Big Shot sling shot (for putting up ropes) all from Sherill (www.wtsherill.com)

- Alpine equipment is essential for ecological studies, but for collecting, two kinds of spikes were recommended; the French griffes are less versatile but more secure; the telephone pole spikes are versatile but do not grip quite as well. The French griffes made by Lacoste et Fils are iron arcs, strapped to the feet, that have spikes on the inside of the arcs. Two sizes are used, one for trees up to 20 cm diam, the other for up to 50 cm. They are heavy, but easy to learn to use and secure on the tree. They are not useful for larger trees or trees with awkwardly shaped boles. They have to be ordered from France. Strong boots are essential for using these spikes. The telephone pole spikes (available from Forestry Suppliers & elsewhere) consist of two steel shanks with a spike on the instep, strapped to the ankle and foot. They are versatile, somewhat more difficult to learn to use, more compact and lighter, but tougher on the ankles.
- Safety belts are of course essential. Relatively heavy-duty nylon web material with two D-rings are recommended; One recommendation for the type with a rear strap for butt support, which avoids wear on the kidneys from prolonged leaning and they are not appreciably heavier. Recommends for using two lanyards for security when getting around boughs.

9. Compasses

- A sighting compass is good for making a line, one recommendation for a Silva Ranger or a Suunto sighting compass.
- You have to be careful with declination (for an extra 10\$, Suunto will adjust the compass for the part of the world where you are working).

10. Insects

- DEET dissolves plastics (like eyeglass lenses) and is reputed to be a health hazard. Some have used it successfully as a tick repellent, while others recommended using any sulfur-based material (like merthiolate) for that purpose.
- Reported varying degrees of success with a number of more home-style repellents, including citrus peel, Skin So Soft (now sold at camping stores), Protium fruits or Tagetes leaves rubbed on the skin, Vick's Vapo-Rub, smoke, etc.
- One non-DEET product in Green Ban (with mixed reviews).
- Head nets are not very comfortable but very useful under extreme conditions such as plagues of sweat-bees, which can be dangerously distracting when you are up in a tree. A head net without a frame costs \$5, fits in your back pocket, and goes over your baseball cap or other hat.
- Note: Several reported that blue clothing tends to attract stinging Hymenoptera.

11. Paper/Notes

- Many participants use the Rite in the Rain field books (although one suggested that people tend to take careless notes in the rain and would be better off recording nothing then).
- Rite in the Rain also make copy paper so you can laser print or photocopy waterproof data sheets
- One person records field observations on a microcassette recorder and transcribes them at night into a hard-bound field book.

- One person urged everyone to make a photocopy of their field books as soon as they are back in civilization; leaving a copy is actually required in Brazil and other places.
- An aluminum sheet holder (from Forestry Suppliers) is useful for writing on in the field and storing pages when rain begins to fall

12. Boots

- Some swear by rubber boots (although someone pointed out that you should not wear rubber boots in a boat). Some are using army surplus ‘jungle boots’, which have drain holes, are light, and dry quickly.
- Leather boots are comfortable, but on extended trips you have to maintain the leather to keep it from separating from the sole.

13. GPS devices

- Many favored Garmin; one has heard that the new eTrek series is accurate, small, and easy to use.
- Several participants said that the external antenna makes a big difference in forest understory (you can climb a tree, too).
- Be sure to get a model that can take an interface cable for a computer.
- Check if model makes lines and polygons in addition to points (if you so desire).
- Some may wish a model that has a data dictionary (allowing you to input data when taking a reading).
- New models allow wireless connection to a tablet PC; one can have an image uploaded onto the tablet PC and do real time ground-truthing.

14. Hammocks and sleeping shelters

- One participant recommended the garimpeiro (miner's) hammock available in Brazil; they are very lightweight and durable.
- For those who don't like hammocks, there was a recommendation for a travel tent (one person and two person from www.LongRoad.com)

14. Flashlights/illumination

- Small, waterproof Mag-Lite flashlights, come in a number of sizes. Be sure to take along extra halogen bulbs. Do not buy black, which is easy to lose in the dark!
- Eveready makes a \$10 combo lantern-flashlight that is pretty versatile and reasonably economical with bulbs. It is not waterproof. It helps solve one sticky problem, which is area lighting, especially when you are pressing plants at night.
- Hand-powered magneto flashlights (sold in the Fischer catalog) and dynamo flashlights (see Real Goods) are surprisingly useful. No batteries needed but they do have a magnet, so keep away from your computer!
- Collapsible candle lanterns can be useful, although the glass can still break if they are abused in the closed position, but they also can easily fall over and become a fire hazard. Regular candles are a must as backup and for area lighting.
- Headlamps are very handy on trails and of course free up the hands; most models tend to consume a lot of batteries. You can buy a cheap Velcro nylon head strap that will convert a Mini Mag-Lite into a headlamp.

- New LED flashlights, but haven't heard from anyone who has used these in high humidity,

15. Knives

- Leatherman-type multi-tools are very popular in the group. On some models the handles of the pliers can be tough on the hands.
- Gerber and perhaps other companies make knife sets that consist of a handle and several types of blades for more serious knife-work.

16. Markers

- Sharpies are economical, but they dry out quickly if left uncapped.
- One recommendation for Ideal-Mark pens, sold by Forestry Suppliers. They are relatively expensive but go a long way, and the valve action makes it so that they are not left worthless if uncapped for a time.
- In a pinch, a pencil or China marker will work too.

17. Magnifiers

- One recommendation for a 10x Bausch & Lomb illuminating magnifier that takes two AA batteries. Good for poorly lit forest understories.
- For herbarium work, there is an illumination magnifier used by philatelists that is about the size of a flashlight and has a millimeter scale on it; it takes two C batteries.

18. Day packs

- One recommendation for day packs have a top compartment; this gives quick access to small items and protects better from the rain.
- One recommendation for the "Orion Trekker" by LowePro. The base is a padded camera case large enough for a camera, a couple of lenses, and a flash, or possibly 2 cameras with lenses and a flash, if the camera bodies are small enough. The upper portion is a small back pack with a couple of zipper compartments. The straps and back padding are excellent; it also has a waist belt.
- One recommendation for the Mountainsmith Day Pack (either lumbar or shoulder).
- One recommendation for external frame packs because they have more options. The pack can be removed and a crate or other equipment can be tied to the frame; further, two external frames can be put together and used to carry an injured person.
- One recommendation for Ortlieb waterproof pack, because you don't have to worry about a surprise storm or canoe-tipping!

19. Pole pruners

- One recommendation for Missouri-style aluminum poles made to order; they have an internal pin on a spring. They are light but rather flexible and can buckle with heavy use.
- A couple recommendations for Jameson fiberglass poles available from Forestry Suppliers. These have an external pin; they are heavier than the aluminum ones but more rigid and perhaps more durable.

- For cord, one recommendation for using tubular webbing rope available from camping stores; otherwise, braided nylon rope can be found. It is important that the rope not have too much elasticity.

20. Pruners

- One recommendation for the Snap-Cut; they are durable and inexpensive.
- One recommendation from the Felco No. 2, which is expensive but self-sharpening, strong, and extremely durable. The Felco No. 5 is less expensive and has great power but is not self-sharpening.
- One recommendation for the Florian ratchet pruners (and pole pruners).

21. Pickling

- Whirl-Pak bags are extremely compact and collapsible, but they can leak. Maybe best to put a number of them into a Tupperware container.
- One recommendation for centrifuge tubes for modest-sized pickles; they are leak-proof and durable.
- Nalgene jars come in all sizes, but they become brittle with time, especially when they contain alcohol or FAA.
- Bundles of newspaper-pressed herbarium specimens that cannot be field-dried should be saturated with 50-70% alcohol and kept out of the sun in airtight, strong, clear plastic bags. One person found that large and/or fleshy fruits must be preserved in 90% alcohol to avoid mold, and the larger fruits must be cut in half.

22. Recording

- One recommendation for Archos Multimedia Jukebox for recording interviews direct to MP3 (as well as storing excess digital photos)--has a Compact Flash adapter
- For digital recorders, check storage medium (a couple of years ago only Memory Sticks were used)
- Check to see if records in stereo
- Be sure to have an external microphone

23. Printing digital photos

- Inkjet-printed digital photos fade rapidly in high humidity
- But, it is easy to purchase glossy inkjet or laser printer photo paper, format photos, and print them
- A number of on-line places allow you to upload photos and they will send you prints (several people recommended www.otophoto.com)
- Some drug stores also have photo kiosks for printing digital photos

24. Note Taking to Digital

- Handspring Visor Prism with portable keyboard for transcribing interviews on the fly.
- Tablet PCs (including new 'rugged', 'waterproof' version)

25. Medical kits

Be sure to see a travel clinic before traveling! A number of items are recommended for medical kits

ace bandage	for sprains; also for light binding above the site of snake bites
alcohol wipes	many uses
allergy cream	Benadryl, Fenegan, Caladryl, Quadriderm, Cortaid, etc.
analgesic pills	aspirin, Tylenol, Ibuprofin, Advil, etc.
antibiotics	for serious infections, bacterial dysentary
anti-diarrhea pills	Imosec, paregoric, Normal Stool Formula, etc.
anti-malarials	
anti-pyretic	
antiseptic cream	
antivenim	to counter snake bite
Bag Balm	effective for extremely dry skin
band-aids	various sizes; colorful ones good if you will be around kids!
butterfly bandages	for more serious cuts
burn cream	
clove oil	for toothache; consider a temporary filling kit
emergency blanket	you can get hypothermia even in the tropics!
Epi-Pen® or Ana Kit®	by prescription to counter anaphylactic shock caused by allergic reaction
eye drops	
foot fungus treatments	creams (Omcilon, Foldan, etc.) or powders (Desenex, Metaxa, etc.)
forceps	fine point, for sutures, removing splinters, etc.
Gatorade	same as rehydration salts, but tastier!
gauze	
iodine	brings splinters to the skin surface
Krazy Glue®	or equivalent; useful for many purposes, including sealing the skin on a serious wound
mebendazol	[optional; for various types of intestinal worms]
merthiolate	or other topical antiseptic
metronidazol	(= Flagyl)[optional; for amoebas, giardia]
razor blades, single edge	for lancing, etc.
rehydration salts	particularly important if you are anywhere near cholera, but also useful under any dehydrating circumstances
rope	80m (surprisingly compact!) heavy duty rope for crossing flooded rivers
rubber gloves	for sterile work (non-latex preferred b/c many allergic)
SAM split	convenient, flexible, compact splinting material
St. John's Wort oil	reputedly antiviral
stomachache remedy	Andrews salts, Tums, etc.
suture kit	available at larger drug stores
swabs	
syringes	even if you don't intend to use them yourself, at least you will have sterile ones if anyone needs one

tape	for taping on gauze
Tea Tree oil	reputedly antiseptic
Topical antifungal cream	
throat lozenges	
vitamins	you may not be eating so well
water purification tablets	
waterproof matches	

B. REFERENCES, METHODS, EXAMPLES

1. People and Plants Conservation Manuals

This series has extremely helpful books that cover theory, detailed methods, and case studies. Cover topics from participatory rural appraisal techniques to community agreements to bark characters.

- Martin, Gary J. Ethnobotany: A Methods Manual.
- Cunningham, Anthony B. Applied Ethnobotany: People Wild Plant Use, and Conservation.
- Laird, Sarah A., editor. Biodiversity and Traditional Knowledge: Equitable Partnerships in Practice.
- Tuxill, John and Gary Paul Nabhan. People, Plants and Protected Areas: A Guide to In Situ Management.

2. Plant Collection and Other Techniques

Alexiades, Miguel N. Selected Guidelines for Ethnobotanical Research: A Field Manual.

3. Ecology Field Methods

Brower, James E., Jerrold H. Zar, and Carl N. con Ende. Field and Laboratory Methods for General EcologyField and Laboratory Methods for General Ecology.

4. Ethnographic Data-Taking

Emerson, Robert M., Rachel I. Fretz, Linda L. Shaw. Writing Ethnographic Field Notes.

5. Botanical terms

- Harris, James G. and Melinda Woolf Harris. Plant Identification Terminology: An Illustrated Glossary.
- Dransfield, J. and H. Beentje. Lexicon Palmarum.
- The Visual Dictionary of Plants

6. Ethnobotany Text

Simpson, Beryl and Molly Ogorzaly. Economic Botany: Plants in Our World.

7. Botany Texts

- Mabberly, D.J. The Plant-Book: A Portable Dictionary of the Vascular Plants

- Smith, Nathan, Scott A. Mori, Andrew Anderson, Dennis Wm. Stevenson, and Scott V. Heald, editors. Flowering Plants of the Neotropics.
- Gentry, Alwyn. A Field Guide to Plants of the Northwest South America (Colombia, Ecuador, Peru).

8. Medical Info

Werner, David. Where There Is No Doctor: A Village Health Care Handbook.

9. Statistics

- Townend, John. Practical Statistics for Environmental and Biological Scientists.
- Gonick, Larry and Woollcott Smith. The Cartoon Guide to Statistics.

10. Examples of Presenting Data

- Buchanan, Rita. A Dyer's Garden: From Plant to Pot Growing Dyes for Natural Fibres.
- Shanley, Patrícia, Margaret Cymerys, and Jurandir Galvão. Frutíferas da Mata na Vida Amazônica.

C. FUNDING

Note: National Science Foundation <http://nsf.gov/home/students/start.htm>. Any new graduate student should apply for funding and many countries have equivalent programs. It's due in November every year, and you can only apply before you start a program or during your first year. If you've completed a year already, it gets harder. Don't believe the people who say that ethnobotany students don't get NSF funding!

1. Ethnobotany/Medicinal Plants

- Botany In Action <http://www.phipps.conservatory.org/learn/research/botany/index.html> is funding ethnobotanical research
- Garden Club of America <http://www.gcamerica.org/scholarships.htm> has a couple grant possibilities open to students in various fields of EB.
- Herb Society of America <http://herbsociety.org> supports herb research.
- Attention medical botany students! NCCAM-NIH <http://nccam.nih.gov> funds predoctoral research <http://grants1.nih.gov/grants/guide/pa-files/PAR-00-023.html> in Complementary and Alternative Medicine. Also, for minority students: <http://grants.nih.gov/grants/guide/pa-files/PA-00-069.html>
- Richard Evans Schultes Research Award from the Society for Economic Botany http://www.econbot.org/awards/schultes_award.html

2. Travel

- Fulbright <http://www.iie.org/Template.cfm?section=Fulbright1> for travel and research abroad. Also for foreign students who want to study in America. Also look at Institute of International Education <http://www.iie.org/>
- Other international (NSF) <http://www.nsf.gov/sbe/int/eap/gradstud.htm> research support

- The Explorer's Club <http://explorers.org> funds trips to exciting places
- American-Scandinavian Foundation <http://amscan.org> funds research in Scandinavia
- American Institute of Indian Studies <http://www.indiastudies.org> funds research in India (mostly humanities)
- Burroughs Wellcome Fund <http://www.bwfund.org> supports research travel grants to the UK
- Torrey Botanical Society <http://www.torreybotanical.org> funds Torrey student members for fieldwork
- East Asia Summer Institutes for U.S. Graduate Students <http://www.nsf.gov/cgi-bin/getpub?nsf02174>
- Richard Evans Schultes Research Award http://www.econbot.org/awards/schultes_award.html

3. Ecology

- Environmental Protection Agency (EPA) STAR Fellowships <http://es.epa.gov/ncer/fellow>
- Earthwatch Institute <http://www.earthwatch.org>
- Hudson River Foundation <http://www.hudsonriver.org>
- E.N. Huyck Preserve & Biological Research Station <http://www.huyckpreserve.org>
- New England Biolabs Foundation <http://www.nebf.org>
- National Commission for Science in Sustainable Forestry <http://www.ncsff.org>

4. Biomedical

- Howard Hughes Medical Institute <http://www.hhmi.org/grants/graduate/application> biomedical research -- due in December.
- The National Academies <http://www7.nationalacademies.org/fellowships/> supports minorities in biomedical research
- NCCAM-NIH <http://nccam.nih.gov> or other offices of the NIH <http://nih.gov>

5. General

- Sigma Xi <http://www.sigmaxi.org/programs/giar/index.shtml> supports student members.
- Paul and Daisy Soros Fellowships for New Americans <http://www.pdsoros.org> due end November
- Ford Foundation <http://www.fordfound.org>
- WWF <http://www.panda.org>
- National Geographic Society <http://www.nationalgeographic.com>
- Wildlife Conservation Society <http://wcs.org>
- UNDP (United Nations Development Programme) <http://www.undp.org>
- UNEP (United Nations Environmental Program) <http://www.unep.org>
- USAID <http://www.usaid.gov>
- [Harry S. Truman Library](http://www.trumanlibrary.org) <http://www.trumanlibrary.org>
- Lindbergh Foundation Grants <http://www.lindberghfoundation.org/grants/index/html>
- Francois Fiessinger Scholarship (Environmental Research and Education Foundation) <http://www.erefndn.org/scholar.html>

6. Anthropology

- Wenner-Gren International Collaborative Research Grants <http://www.wennergren.org>
- National Security Education Program (NSEP) <http://www.aed.org/nsep/index.html> for research about language and culture
- Social Science Research Council <http://www.ssrc.org>

7. Funding for international students studying in America

- AAUW (American Association of University Women) <http://www.aauw.org/3000/fdnfelgra/internat.html> due in December
- OAS <http://www.educoas.org/Eng/becas/becas1.html>

8. Dissertation writing fellowships/grants

- Doctoral Dissertation Improvement Grants <http://www.nsf.gov/cgi-bin/getpub?nsf02173> in the Directorate for Biological Sciences (NSF)
- AAUW (American Association of University Women) <http://www.aauw.org/3000/fdnfelgra/> due in November

Other sites with funding lists

- CUNY Ecology and Evolutionary Biology program grant links http://web.gc.cuny.edu/eeb/student_funding/index.html
- CUNY Plant Sciences program grant links http://a32.lehman.cuny.edu/PlantPhD/grant_sources.html