

La Selva Operational Procedures Manual

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Glossary of Abbreviations and Definitions

ACCVC	Area de Conservación Cordillera Volcánica Central
BCNP	Braulio Carrillo National Park (Parque Nacional Braulio Carrillo)
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CATUSA	Sarapiquí Tourism Association (Cámara de Turismo de Sarapiquí)
CONICIT	Consejo Nacional de Investigaciones Científicas y Tecnológicas
Exotic	Species and/or genetic provenance not native to La Selva.
FUNDECOR	Foundation for the Development of the Cordillera Volcánica Central
FPN	National Parks Foundation (Fundación de Parques Nacionales)
GIS	Geographic Information System
INBio	Costa Rican National Biodiversity Institute (Instituto Nacional de Biodiversidad)
OTS	
AoD	Assembly of Delegates.
BINABITROP	OTS bibliographic database to all publications on biological research conducted in Costa Rica since 1956 (Bibliografía Nacional en Biología Tropical).
BoD	Board of Directors.
CEO	Chief Executive Officer.
CRIC	Costa Rican Institutions Committee.
CRO	OTS Costa Rican Office in San José.
ESINTRO	The for-profit subsidiary of OTS in Costa Rica (Estudios e Investigaciones Tropicales S.A.).
NAO	OTS North American Office at Duke University
OTS	Organization for Tropical Studies.
La Selva	
La Selva	The La Selva Biological Station.
Greater La Selva	The La Selva Biological Station and the surrounding region.
LSAC	La Selva Advisory Committee.
LSMP	La Selva Master Plan
LSOM	La Selva Operations Manual
LSSD Station Director	Responsible for scientific administration at La Selva.
LSAD Administrative Director	Responsible for operations and financial management at La Selva.
Laboratory Manager	Manager of the ecological and analytical laboratories. Assigns desk/lab space.
Station Naturalist	Manager of La Selva's botanical identification resources.
Laboratory Assistant	Assists Laboratory Manager and Station Naturalist. Responsible for library maintenance.
GIS Manager	Manager of La Selva's GIS laboratory.
Groups Coordinator	Assists education groups. Assigns meeting space.
Senior Researcher	Researchers with Ph.D. or fulltime position as independent researcher or faculty member.
Student researcher	Student (undergraduate or graduate) without Ph.D. conducting research as part of their education.
Long-term researcher	Researcher (student or senior) remaining in continuous residence at La Selva for ≥ 30 days.
Nonresident Researchers	Investigators conducting research at La Selva or using La Selva facilities, but residing off station.
Research Technician II	Research project personnel with access to laboratories and with university training up to and including Masters degree, but lacking Ph.D
Research Technician I	Research project personnel with access to laboratories but without university training.
Field Worker	Research project staff without access to laboratories.
Costa Rican Government Institutions	
FONAFIFO	National Forest Finance Fund (Fondo Nacional de Financiamiento Forestal)
CCSS	Costa Rican Social Security (Caja Costarricense del Seguro Social)
MAG	Ministry of Agriculture (Ministerio de Agricultura y Ganadería)

MEP	Public Education Ministry (Ministerio de Educación Pública)
MINAE	Environment and Energy Ministry (Ministerio de Ambiente y Energía)
MS	Health Ministry (Ministerio de Salud)
MSP	Public Security Ministry (Ministerio de Seguridad Pública)
MTSS	Ministry of Labor (Ministerio de Trabajo y Seguridad Social)
SPN	National Parks Service (Servicio de Parques Nacionales, part of MINAE)

TABLE OF CONTENTS

Glossary of Abbreviations and Definitions.....	1
Greater La Selva Principal Areas and Zoning.....	5
I. INTRODUCTION.....	6
II. STATION USE GUIDELINES.....	6
A. Overview.....	6
B. Housing.....	7
C. Work Space.....	8
D. Resident and Nonresident Researchers.....	8
E. Education Groups.....	8
F. Natural History Visitors.....	9
G. Food Service.....	9
H. Station Use Limits.....	9
III. RESEARCH MANAGEMENT POLICY.....	10
A. Informing Users of On-Site Regulations.....	10
B. Research Proposal Review.....	10
C. Restricted Activities.....	12
D. Specific Regulations on Research.....	12
IV. INTRODUCTION OF EXOTIC ORGANISMS TO LA SELVA...	15
V. ZONING OF GREATER LA SELVA.....	16
VI. HABITAT MANAGEMENT AT LA SELVA.....	19
A. Areas of Secondary Succession.....	19
B. Pasture Management.....	19
C. Holdridge Arboretum.....	19
D. Forestry Species Elimination TRIALS.....	20
E. CATIE Fuelwood TRIALS.....	20
F. OTS/Costa Rican Forest Service “Canadian” Native Trees	20
G. OTS (TRIALS Project) Tree/Soil Plots.....	20
H. Control of Invasive Exotic Species	20
I. Trails.....	20
VII. INFORMATION MANAGEMENT.....	21
A. Maintenance of Collections at La Selva.....	21
B. The La Selva Library.....	22
C. Imagery.....	22
D. Lists and Keys of La Selva Flora and Fauna.....	22
E. Researcher Responsibility for Metadata and Data Deposition....	22
F. Informing Researchers of Data Availability.....	23

G. Records of Research and Researchers at La Selva.....	23
VIII. POLICY FOR SUPPORT AND MANAGEMENT OF	
EDUCATIONAL USE OF LA SELVA.....	23
A. Informing Educational Groups of On-Site Regulations.....	23
B. University Courses in Tropical Science.....	23
IX. SAFETY.....	24

Greater La Selva Principal Areas and Zoning

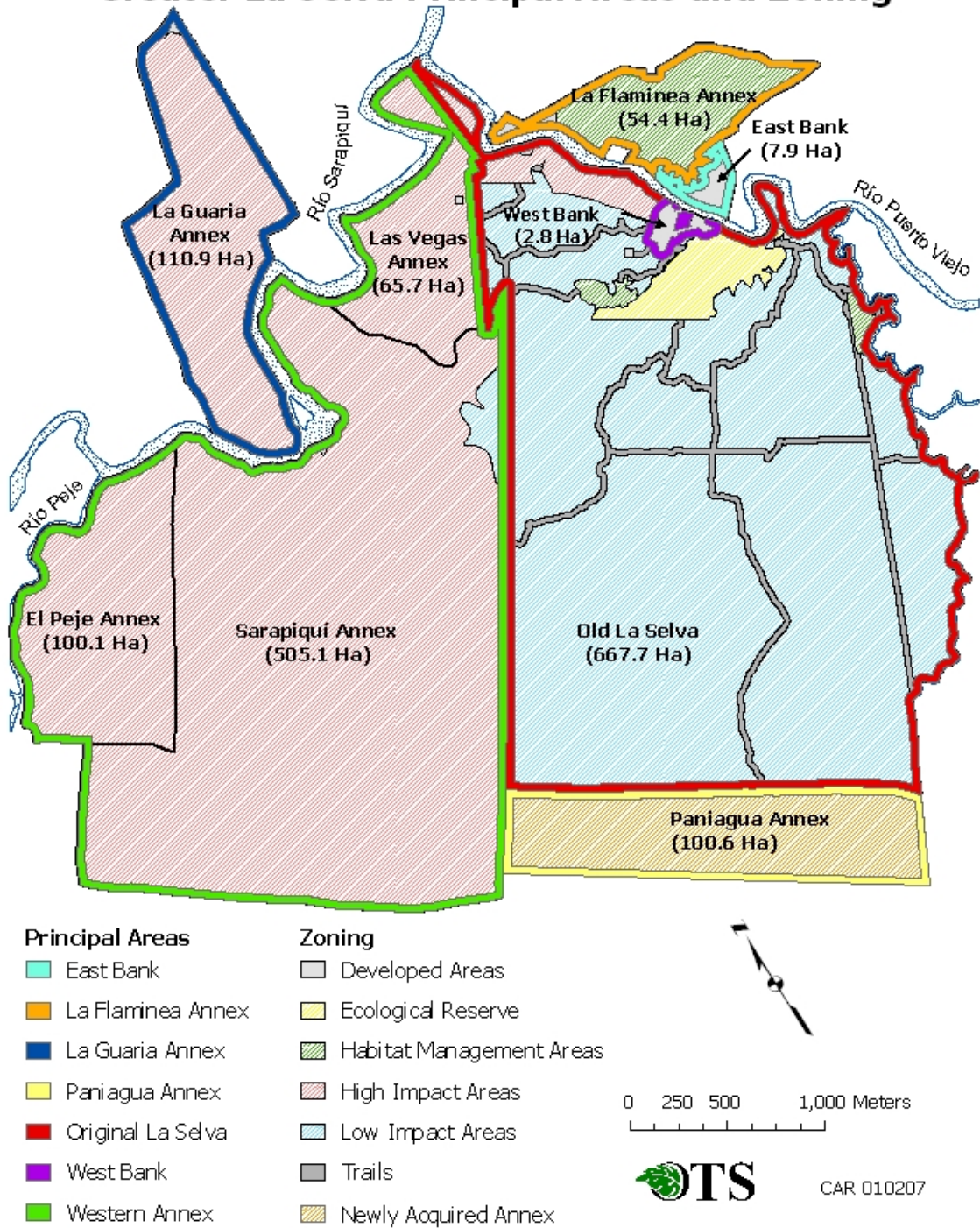


Figure 1

List of Areas of La Selva (displayed in Fig. 1)

Old La Selva. Core 667.7 ha reserve; this is the southeastern section of the property, bounded by the Río Puerto Viejo, the Quebradas Sábalo and Esquina, the Lindero Sur [border with Braulio Carrillo National Park], the Lindero Occidental, and the Las Vegas Annex.

East Bank. The 7.9 ha parcel on the east side of the Puerto Viejo River, site of the dining room/dorm complex.

West Bank. The 2.8 ha developed parcel on the west side of the Puerto Viejo River, site of the laboratories and cabinas.

Las Vegas Annex. The 65.7 ha section bounded by the Sarapiquí River, Old La Selva, and the Sarapiquí Annex.

Sarapiquí Annex. The 505.1 ha section SW of Old La Selva, bounded on the west by the Río Sarapiquí and the Peje Annex.

Peje Annex. The 100.1 ha section bounded by the Sarapiquí Annex, the Ríos Peje and Sarapiquí, and Braulio Carrillo National Park.

Western Annex. The combined area, 670.9 ha of the Las Vegas, Sarapiquí, and Peje Annexes.

La Guaría. The 110.9 ha section due N across the Río Sarapiquí from the Las Vegas and Sarapiquí Annexes.

La Flamínea. The 54.4 ha section north of the East Bank, bounded by the Río Puerto Viejo, the dirt road to Puerto Viejo, the East Bank, and the Napoleón Murillo farm.

Paniagua (formerly New) Annex. The 100.6 ha section south of old La Selva along the Lindero Sur.

I. INTRODUCTION

This La Selva Operations Manual (LSOM) was established to provide guidelines for the operation of the La Selva Biological Station and establishes how the broad policies outlined in the La Selva Master Plan (LSMP) are to be implemented. In accordance with the LSMP, this Operations Manual must be reviewed and approved by the La Selva Advisory Committee biennially.

II. STATION USE GUIDELINES

A. Overview

These guidelines for usage of La Selva are intended to support the goals and values of the Organization for Tropical Studies, which include facilitation of research and education, as well as the dissemination and sharing of knowledge of tropical systems. We expect all members of the La Selva community to embody values of honesty, integrity, respect, and professionalism, for the purpose of maintaining a collegial, supportive, and productive atmosphere. All station users, including researchers, students, and visitors, are expected to adhere to the guidelines of this Operational Procedures Manual, the policies of OTS, and the laws of Costa Rica. Non-compliant behaviors (including, but not restricted to, sexual harassment, intimidation, verbal or physical abuse, intentional interference with others' research activities, theft, or vandalism) may result in loss of access to La Selva and its facilities.

Facilities and Station Lands

It is the overall responsibility of the Administrator Director of the Station (LSAD), under direction of the Station Director (LSSD), to manage the facilities at LS. This responsibility includes managing food service, allocating housing to both research and education groups, and managing staff responsible to maintaining the facilities. In accordance with the La Selva Master Plan, station use and impacts are reviewed annually by LSAC.

B. Housing

The allocation of housing and reservations is the overall responsibility of the LSAD. The priorities listed below are designed to facilitate this responsibility. When unusual conditions arise, exceptions to these policies may be approved by the LSAD, as long as they are done in coordination with the LSSD and do not result in any long-term inequalities to visitors or damage to the facilities.

Whenever possible, La Selva endeavors to provide single occupancy housing for researchers. Together, La Selva's 16 cabina rooms (west bank lab clearing area), La Flaminea's 8 rooms in Arriera Zompopa, and the remodeled Holdridge house (River Station) can lodge up to 42 long-term researchers in single occupancy rooms. Two family houses (each with two bedrooms) will be prioritized for researchers with children, bringing the total number of single occupancy researcher rooms to 45 (assuming one researcher per family house).

La Selva researcher use is strongly affected by the academic calendar. Hence, during peak periods (typically during January-March and June-July) it may be necessary to relax the policy on single occupancy housing for researchers, but this will be done only on a short-term basis. La Selva administration will make every effort to notify 8 hours in advance room occupants and arriving visitors who will be sharing a room that they will have roommate.

1. Family House Assignment Policy

Two of the four family houses are reserved for researchers with families and the remaining house for course faculty. All family houses must be reserved 30 days in advance. When no reservations are made, the LSAD will allocate family housing, in order of priority, to: researchers with family (the one course faculty house), senior researchers, educational groups, film production crews, natural history and other visitors.

2. Researcher Cabina Assignment Policy

La Selva's cabinas were constructed to provide more comfortable housing for 1) senior and 2) long-term student researchers. Two of the 8 cabinas in the La Flaminea Residential Zone will be prioritized for senior researchers (short- and/or long-term). Researchers with spouse or companion will have priority over single researchers (children will be housed only in the family houses). As with family houses, the prioritized cabinas must be reserved 30 days in advance. Those not reserved will be let to short-term researchers with the understanding that they must vacate prior to the next confirmed senior researcher booking.

The remaining La Flaminea and west-bank Cabinas will be prioritized for long-term student researchers and technicians. Long-term senior researchers will have priority over student researchers only in the event all senior researcher cabinas and family houses are occupied. Student researchers with spouse or companion will have priority over other student researchers. Ordinarily, student researcher demand for long-term cabinas exceeds supply, making it impossible to reserve cabinas in advance. Hence, student researchers will initially be booked into the river station and will be transferred to cabinas as they become available on a first come first serve basis. La Selva reception will maintain a waiting list for cabinas and will add researchers to this queue upon request.

Long-term researchers vacating a cabina without maintaining payment, but returning to La Selva within 10 days, will be placed at the top of this queue or just behind other researchers already in the queue under the same circumstances. Researchers must have at least 45 days of consecutive occupancy between 10-day absences. Researchers alternating between OTS field stations who have established long-term status at one or a combination of OTS stations will be placed at the top of the queue or behind other long-term researchers already in the cue coming back from up to 10 day absences.

3. Policy on Unoccupied Rooms

Station fees will be charged for every day a room is occupied. Rooms will be considered occupied unless the resident checks out with La Selva reception.

C. Work Space

OTS promises to provide desk or laboratory bench space (approximately 1.5 m of desk or bench space) to all station researchers. Additional space may be rented upon request. The Laboratory Manager assigns office and lab space and must be notified ahead of time of special needs. La Selva currently has office and lab space as follows: 58 office spaces contained in 30 air-conditioned offices with locking door (approximately two researchers per office) in the Analytical (New) and Ecological (Old) labs, 16 lab bench spaces in the Analytical (New) Lab, and 5 desk spaces in open air-conditioned space. This total of 79 potential lab/office spaces includes space used by scientific staff (approximately 6 spaces) and long-term project technicians. This does not include office space used by scientific and project staff in the Ceiba building, in the herbarium, or in the new TEAM/ALAS Biodiversity Center.

D. Resident and Nonresident Researchers

During the last several years, the number of La Selva researchers living offsite has increased. Nonresident researchers and project technicians live offsite, pay the day visitor station rate, and have access to the laboratories. Field workers who reside offsite pay no station fees and thus do not have access to the laboratories. These station users (nonresidents) do not impact La Selva's housing facilities and utilize La Selva food service less than overnight visitors, but they do occupy office space, laboratory facilities, and the forest reserve. There are 42 single occupancy rooms at La Selva (16 in researcher cabins, 18 in the river station, and 8 in Arriera Zompopa). The number of researchers at La Selva may be constrained either by housing availability or by office space, depending on how many offices are occupied by nonresident researchers and project technicians. La Selva will attempt to provide researchers with single occupancy rooms whenever possible. Single occupancy housing would limit the number of resident researchers to 42 per day (with a small upward adjustment if researchers are also occupying family houses). If each of these researchers occupied one office space, this would in turn limit the nonresident (walk-on) researchers to 31 per day (79 total, minus 6 for scientific staff, minus 42 for resident researchers leaves 31 office/lab spaces for nonresident researchers). Note: as in the above analysis, these numbers do not include the project technicians in the Biodiversity Center.

E. Education Groups

La Selva limits education groups and professional workshops to 60 overnight students. Students for these educational groups will be accommodated in the Iguana or Tortuga dormitories whenever possible, whereas faculty will have priority use of one family house. Because of interference with researchers housed in the river station, courses should not be booked into the River Station except under extraordinary circumstances. Courses will meet in the Academic Center and Visitors Center. Large courses (courses of 20 or more) will normally have use of one of the two wings of the Academic Center; options for additional course use will be the Visitor Center, and the small air-

conditioned classrooms next to the Conference Center. Local community groups and the visitors of the environmental education program, who typically visit the station during the day, meet in the Visitor center and count in the education day visit limit (Table Summary of daily station use limits). Recommended student to faculty ratios for overnight courses are: 20:1 for graduate courses, 12:1 for undergraduate courses, and 6:1 for K-12 courses. Because of the potential safety and liability issues, overnight visitation by K-12 courses is discouraged.

F. Natural History Visitors

Natural history visitation is limited to a total of 100 visitors per day and a total of 504 visitors per week. The 100 visitor per day limit is intended to provide flexibility to accommodate infrequent peak use days, such as visits by cruise ship passengers, whereas the weekly limit constrains average use to 72 persons per day (equal to 6 guided walks at 12 persons per walk). Day natural history visitors on the west side of the Rio Puerto Viejo are restricted to naturalist-led walks on paved trails. Use of these trails causes no physical impact to the reserve and does not cause significant interference with research or education activities. To avoid congestion on trails and to limit contact between natural history groups and academic users, guided walks are coordinated by La Selva’s Natural History Visitor Program to minimize multiple groups encountering each other on the paved trails. Walks will be scheduled in advance to allow researchers doing behavioral observations (or for that matter, natural history visitors watching birds) to avoid the disturbance of interactions with other groups.

Any visitors in the natural history category staying overnight will be counted against the daily and weekly limits stated above (504 per week). Overnight natural history visitors, however, are not restricted to paved trails.

G. Food Service

Although La Selva's facilities are adequate for normal station use, the dining hall is frequently crowded at lunchtime. To alleviate dining hall congestion and to make meal-times more convenient for priority users (researchers and educational groups), on days when the number of plates served exceeds seating capacity (approximately 90), the following changes in food service management will be implemented: 1) the normal 11:30 AM – 1:00 PM lunch period will be extended by ½ hour to 1:30 PM; and 2) lunchtimes will be staggered for La Selva's three principal user groups – natural history visitors or researchers will lunch at 11:30 and educational groups at 12:30. While it is the intention of LS to allow groups to freely exchange during meals, when it is necessary to stagger meals they will be served to researchers, education groups, staff and natural history visitors in that order of priority. Station users will be informed when they should come to the dining hall.

H. Station Use Limits

Given the foregoing discussion, maximum daily station use is set at 385 visitors on any given day with the following user limits by category:

Summary of daily station use limits

User Group	Daily Limit (persons)
Research (Overnight & Day) (constrained by housing and desk/lab space)	~60 ^a
Project Personnel (constrained by desk/lab space for lab users and by overall impact for field workers)	~50 ^b
Education Overnight (constrained by number of classrooms and dormitory spaces)	60 ^c

Education Day and Local Groups (constrained by meeting spaces and overall impact)	30 ^d
Natural History (constrained by bridge and trail use and by overall impact including interference with other user groups)	100 ^e
Other (VIPs, film crews, reporters, government officials, etc.)	20 ^f
OTS Staff	65
TOTAL	385

^aSee Section D.

^bPersons on the OTS payroll dedicated to projects.

^cBased on available housing for two courses of 30 persons maximum each + faculty.

^dOne group of 30 persons maximum.

^eLimited to a weekly total of 504. See Section F.

^fOnly when family houses and dormitories not occupied by education groups.

III. RESEARCH MANAGEMENT POLICY

A. Informing Users of On-site Regulations

The management and coordination of research and education activities at LS is the general responsibility of the LSSD. The goal of this responsibility is to promote research and education while maintaining the long-term biological integrity of the site. Detailed research guidelines and regulations are provided below and are posted on the La Selva website. A condensed set of regulations and other useful information is contained in the User’s Guide to La Selva. This information is supplied to researchers and education groups electronically before they arrive at La Selva, and/or in hard copy when they arrive at the field station. New researchers are also required to receive an orientation from the Laboratory staff before they use the facility.

B. Research Proposal Review

A proposal to conduct research in LS must be submitted in writing to the Station Director, in either Spanish or English. Researchers arriving on site without prior proposal approval will not be allowed to initiate research. One time, brief ‘exploratory’ visits will be permitted for prospective researchers who wish to visit the station and evaluate whether La Selva is appropriate for the type of research they wish to conduct. Such exploratory visits do not require submission of a written proposal, but do require prior approval of the Station Director. Researcher station reservations will not be valid without La Selva Station Director approval. Proposals should be submitted electronically (in word or pdf format).

Proposal Contents. Proposals should describe the project objective, funding source, nature of the methods to be used, location where the research will be conducted, whether or not specimens will be handled, collected or exported and the duration of the project. Ordinarily proposals written for other purposes, such as grant or thesis proposals, are acceptable, but prospective investigators are advised to review the research regulations below and ensure that project methods are described in sufficient detail to evaluate the potential impact of the proposed research.

LSAC Review. At his or her discretion, the La Selva Station Director may refer any project to LSAC for review. Projects classified as high impact (section 10 below) are automatically referred to LSAC. The La Selva Station Director will notify prospective researchers if their proposal requires LSAC

review. Researchers or their representatives are invited, but not required, to attend the initial discussion of their proposal at the LSAC meeting. They may be requested to make a short verbal presentation or to answer questions concerning their project. After the initial discussion, the researcher will be excused from the meeting for the final discussion and vote. If the researcher is also an LSAC member he/she will be excused from the final discussion and vote.

Outside Review. Either the Station Director or LSAC may send proposals under consideration for review by outside scientists with pertinent expertise if deemed necessary.

Duration of Review Process. The La Selva Station Director will make every effort to complete this review process as rapidly as possible. Review of all proposals not requiring LSAC or outside review will be completed within 30 days of receipt. For proposals receiving LSAC or outside review, decisions will be made as quickly as possible, but in all cases researchers will be notified of status of review in 2 months and notified of decision within 6 months of receipt of the proposal by the La Selva Station Director.

1. Notification of results of review. Prospective researchers will be notified in writing of project approval or rejection. In the case of approval, the Station Director will stipulate in the notification any conditions of approval. In the case of rejection, the reasons why the proposal was declined will be enumerated and suggestions will be made as to how the project could be modified to be in accordance with station policy.

2. Metadata submission. Project approval is contingent upon researchers depositing and maintaining metadata for their project upon departure from the station. As part of project approval investigators must acknowledge, in writing or by email, their acceptance of station regulations concerning metadata. Metadata is required of all researchers using station facilities, even for those conducting research outside of station boundaries. It is the ultimate responsibility of the LSSD to insure that projects submit proper metadata upon departure. However this responsibility maybe delegated to GIS manager.

3. Archival Datasets. OTS may also oblige investigators to deposit datasets of broad research utility with OTS. This policy is discussed in more detail in Section VII.E.3 (Researcher Responsibility for Metadata and Data Deposition with OTS).

4. Publications. Each researcher carrying out thesis research at La Selva is required to donate three copies of their thesis to OTS, while other researchers must deposit three reprints of all publications resulting from La Selva research with OTS.

5. Costa Rican Government Permits. All research conducted in Costa Rica now requires a Costa Rican Government research permit, even if collecting will not be conducted (approval of collecting is now subsumed within this research permit). Researchers who wish to transport biological specimens or their derivatives outside the country must also acquire a Costa Rican Government exportation permit. CRO staff assist researchers acquire permits for a nominal service fee. Permit acquisition should be initiated at the time of proposal submission to the LSSD, because permits can take some time to complete. Costa Rican Government permits must be renewed every six months. Failure to maintain permits up to date will be cause for rescission of project approval.

6. Animal Care and Use Approval. Researchers are expected to provide evidence of IACUC approval from the home institution. Researchers from institutions not covered by such protocols must provide comparable animal care and use compliance.

7. High Impact Projects. High impact research projects are automatically referred to LSAC for review. Researchers should provide especially clear methods if high impact activities are being proposed. The following activities constitute high impact research.

- a. Collecting vertebrates (except cases listed in section D.8)
- b. Collecting rare species of invertebrates or plants

- c. Large-scale destructive plant or invertebrate sampling
- d. Collecting significant numbers of seeds or seedlings outside of the designated seed collection zones. (see section D.5.)
- e. Tree coring in the low impact zone.
- f. Long-term allocation of plots > 100 sq. m
- g. Habitat manipulation at a scale > 100 sq. m in low impact research areas.
- h. Application of substances such as isotopes, herbicides, pesticides, or fertilizers
- i. Introduction of exotic (i.e. Non-La Selva) animals, plants, microorganisms or genetic material
- j. Installation of major equipment or infrastructure.
- k. Proposed experimental manipulations (e.g. Forest cutting, pesticide application) in a broad spatial and temporal context that specifically includes:
 - Effects of proposed manipulation on the quality of surface water or ground water draining the area.
 - Effects of the proposed manipulation on use of adjacent areas for other projects now and in the future.
 - Consideration of proposed manipulations with respect to the amount of remaining habitat of that type left in the Sarapiquí annex.

8. Lower Impact Projects (not involving any of the points listed above). These will be reviewed by the La Selva Station Director.

9. Deposits. Researchers must deposit funds to cover expected cost of removal of installed equipment and the eradication of exotic species introduced for research purposes. Researchers may be also billed for trash removal or any other cost incurred by LS

C. Restricted Activities

1. Machetes. Use of machetes within La Selva without OTS permission from the LSSD is prohibited. Unless research or education personnel have received specific permission, they are not allowed to carry a machete in the forest or on the trails of Greater La Selva.

2. Firearms. The only firearms allowed in La Selva are those 1) carried by authorized security personnel and 2) shotguns used for the sole purpose of collecting out-of-reach plant material, with the permission of the Station Director. Researchers using firearms must have all the necessary permits required by Costa Rican law and file copies of these permits with the La Selva Administrative Director. All firearms must be kept in locked cabinets when not in use.

3. Canopy Access. Researchers and students must obtain permission from the Station Director before initiating any project or other activity involving canopy access. In granting permission, the Station Director will consider both how experienced the individual is at climbing and how adequate safety measures will be. Inexperienced climbers should never climb unless accompanied by an experienced climber.

D. Specific Regulations on Research

1. Collecting

Any collecting at La Selva must satisfy general criteria listed below.

- a. The need for specimens is well-justified by a research proposal submitted to OTS.
- b. The evidence indicates that the level of proposed collecting would not damage La Selva populations (considered here are the estimated abundance of the species, whether or not it is widespread in La Selva, and the number of individuals to be collected).
- c. Collecting by education groups must be coordinated with Station Director.

2. General collecting. General collecting is the collection of specimens which are not directly required for an approved research or educational project. Such collecting is not permitted at La Selva.

3. Costa Rican Permits. Collections can only be made when approved as part of the Costa Rican research permit. Permit regulations require that when collections are made, duplicate voucher specimens must be deposited with a Costa Rican government institution. The collector must provide OTS with complete information on these specimens, including origin and deposition.

4. Deposition of specimens. Representative material from all collections should be deposited in a major public access collection (i.e. facility with permanent curatorship and a loan policy), preferably in Costa Rica. Investigators should collect duplicate specimens of plant species not represented in the La Selva herbarium and submit these to the Station Naturalist.

5. Collecting seeds or seedlings in La Selva. Collection of seeds or seedlings is destructive sampling with high potential impact for many plant species. Fruits and seeds falling on the ground inside trail margins (border marked by cut vegetation), in the Developed Areas, and in the Arboretum can be freely collected for approved research projects, as can seedlings growing in these sites. For collecting in any other sites within La Selva, specific permission must be obtained from the Station Director. The policy for such collecting at La Selva is as follows:

- a. Species that are known to have extremely limited reproductive output, or whose adults are very rare, may be declared off-limits to collecting. This decision will be made by the Station Director with advice from LSAC if appropriate.
- b. Species that are currently under demographic study cannot be collected within 100 m of the study area without the consent of the principal investigator conducting demographic study.
- c. Collecting seeds from plants within areas zoned Low Impact is restricted to a one-time sample of 10% of the standing crop of seeds on the ground or on the plant.
- d. In the Sarapiquí Annex west of the Sarapiquí Trail, seeds of any species in any quantity may be collected for approved research projects (subject to points a and b).
- e. Within sites zoned High Impact, the Station Director can designate individual trees or areas for intensive seed collection..

6. Other Plant Materials. Small-scale, non-destructive sampling of common plants (pieces of branches, a few inflorescences, etc.) does not require special approval but should be discussed with the LSSD prior to sampling. Destructive sampling (resulting in the death of individual plants) requires specific approval.

7. Invertebrates. Collecting directly related to an approved research project does not usually require special approval. Collection of butterflies of the genus *Morpho*, other commercially desirable species, or species thought to be rare at La Selva does require special permission. Courses are allowed to collect representative specimens for teaching purposes, except of proscribed species, with live capture and release always preferred.

8. Vertebrates. Collection of vertebrates generally requires LSAC review. Exceptions may be made by the Station Director, for proposals for limited collecting of species that appear to be very abundant. Collection of a single voucher specimen for species previously unknown from La Selva can also be approved by the Station Director, subject to Costa Rica laws.

9. Salvage collecting. When plots are to be cut at La Selva for any purpose (construction, research) OTS requests that the responsible party actively encourage salvage collections of flora and fauna likely to perish as a result of the clearing. The responsible party would notify appropriate interested specialists within and outside of Costa Rica well in advance of the clearing procedures. The party or parties actually doing the salvage collecting would incur the costs associated with that activity.

10. Long-term and Restricted Access Plots and or Taxa. New long-term plots or exclusive access to plots, organisms, or populations of organisms are possible, subject to LSAC approval. However, La Selva values the concepts of duplication and collaboration as part of the scientific process and, therefore, will discourage exclusivity except in scientifically well-justified cases.

Requests for such limitations will be carefully considered in the spirit of minimizing constraints on the entire research and education community. Approval for restricted access will depend on scientific justification of the restriction and impact on other station use at La Selva. Requests must include a specific time span for the allocation as well as any OTS-approved limitations on access by other users. In the case of plots, researchers should include in their request of allocation of space an appropriate buffer zone, if they are concerned about potential alterations around the edges of their study plots by other projects. New long-term plots in low-impact areas will be sited at least 15 meters from the trails. Zoning of high and low impact is described in section V. In the case of a taxon, researchers requesting restricted use must carefully define the distribution of that taxon or population. The investigator may request a specific buffer zone bordering a population so defined.

When other users request access to a long-term plot, taxon, or population for activities not restricted by OTS-approved access limitations, OTS will forward the request to the PI managing the primary research to determine if compatible usage arrangements can be worked out directly by the interested parties. Details of such arrangements must be forwarded by the PI to OTS. If the holder of restricted access finds the request incompatible with the primary research in the plot, he or she must submit in writing to OTS an explanation of the incompatibility. In this event, OTS will decide whether to approve or deny the additional use requested.

11. Use of Chemicals. Approval for the application of chemicals or biocides (e.g. fungicides, herbicides, insecticides nematocides, etc.) must meet all of the following criteria:

- a. Other reasonable methods have been attempted and do not work.
- c. The success of the research project rests on this application.
- b. The researcher and/or technician is judged to be qualified to handle the chemical.
- d. Pesticides must be stored safely in a manner approved by the La Selva Laboratory Manager and the MSDS of the chemicals must be provided by the investigator.
- e. The investigator must provide for safe disposal of all chemicals and associated waste brought to the station in a manner approved by the La Selva Laboratory Manager.

When approval is given for application of a pesticide with persistent toxicity, the following data will be reported to the LSSD: name of the substance, date and method of application and precise location of application. The site of application will be permanently marked in the GIS and where appropriate in the field.

12. Handling Vertebrates. Research or educational projects that entail the risk of killing vertebrates requires approval of the Station Director. Examples include live-trapping, mist-netting, restraint (physical or chemical), and radiotelemetry. Mist-net operation requires one experienced operator on site. The experienced operator may supervise mist-netting by inexperienced operators. Any handling of venomous snakes must be associated with an approved research project and must be approved by the Station Director. Investigators should specify when and where sampling will occur and:

- a. The methods to be used, including evidence that techniques are state of the art.
- b. Precautions to be taken to minimize injury and death to the animal.
- c. The extent of the user's prior training in the methods of capture and handling.

13. Marking Organisms and Plots. The following guidelines pertain to marking organisms and plots in greater LS. As a general principal, the researcher is responsible for clearly marking research sites in a manner that will last for as long as is necessary to protect the integrity of the research and La Selva. Prior approval is required for a researcher to leave permanent markers in La Selva.

a. Plants and Plots. Every researcher is required to consult the La Selva map to become familiar with restricted access areas. Those establishing plots, transects, or permanent markers must consult the GIS manager to verify that the location chosen is not within already established plots. The

researcher must clearly mark such plants or sites and register their location with the GIS manager. Such markers need to show the researcher's name or must be clearly identifiable as belonging to a specific project. If the researcher fails to return to continue the study as planned, the markers will be removed, and the labor costs will be charged to the researcher.

Visitors to La Selva and station personnel are advised not to touch marked plants and to stay out of demarcated plots. Researchers are advised not to mark plots or plants that occur in close proximity to trails, because trail maintenance takes precedence over such markers.

b. Trees. Because steel nails are toxic to trees, nails used to affix tags should be aluminum. Nails should be driven in at an angle from the bottom (i.e. with the point higher than the head). Tags will thus hang away from the bark and nails will channel water flow off the tree.

c. Animals. Researchers must consult with the Station Director before marking animals. In all cases of permanent or long-lasting marks, a list of the marked individuals must be left for the La Selva database. All marking of vertebrates must be coordinated with existing marking systems. All external transponders should be removed from all animals at the conclusion of the project unless it endangers the lives of the animal to remove it.

IV. INTRODUCTION OF EXOTIC ORGANISMS TO LA SELVA

The regulation of exotic species in La Selva is necessary to maintain the integrity of the reserve. Exotic species that could escape and become pest species in the surrounding rural region of Sarapiquí; exotic species that might escape and thrive in the natural communities of La Selva and the potential introduction of foreign genes into La Selva populations with consequent negative impact on genetic studies are matters of special concern.

The objectives of this policy are:

- To insure that experimental introductions of genotypes not indigenous to La Selva do not spread, either within La Selva or in surrounding areas.
- To minimize the risk that gene flow from the introduction could compromise genetic research or harm indigenous populations.
- To encourage and facilitate research directed toward the solution of pressing ecological problems through judicious introduction of exotic genotypes.

Release of wildlife confiscated by local authorities is not permitted within La Selva. To bring exotic animals or plants into La Selva, the researcher must obtain prior approval from LSAC. In addition they must take complete responsibility for the vigilance, caging necessary to prevent escapes, and the subsequent removal from Greater La Selva. Such animals are restricted to the La Guaria Annex, La Flaminea, or the East Bank. They must be subsequently removed from Greater La Selva by the researcher. Proposals should summarize available information on the following points, on which the LSAC evaluation will be based (this information should be referenced to the literature and other sources):

1. Geographic extent and habitat of the proposed introduction.
2. Taxonomic relatedness to La Selva species.
3. Size and characteristics of local populations of the same or related species.
4. Provenance of seeds, in the case of species already at La Selva.
5. History of introductions to other areas where not indigenous, especially any evidence that the species is invasive.
6. Reproductive biology, including vegetative reproduction, pollination, and seed dispersal.

7. Susceptibility to pathogens or pests potentially dangerous to native or economically important species in Costa Rica.
8. Eradicability, in the event of spread.
9. Other relevant natural history information (e.g., invasive congeners).
10. Experimental design, including:
 - a. Size of plantings.
 - b. Type of propagule to be used.
 - c. Periodicity and characteristics of monitoring to be carried out by the investigator.
 - d. Financial provision for adequate monitoring by OTS, removal of the planting at termination of the study (or earlier, if spread occurs), and post-removal.
 - e. A GIS coverage of the location of the introduction. This coverage must be maintained throughout the project.

The following rules guide the approval of projects by the LSAC.

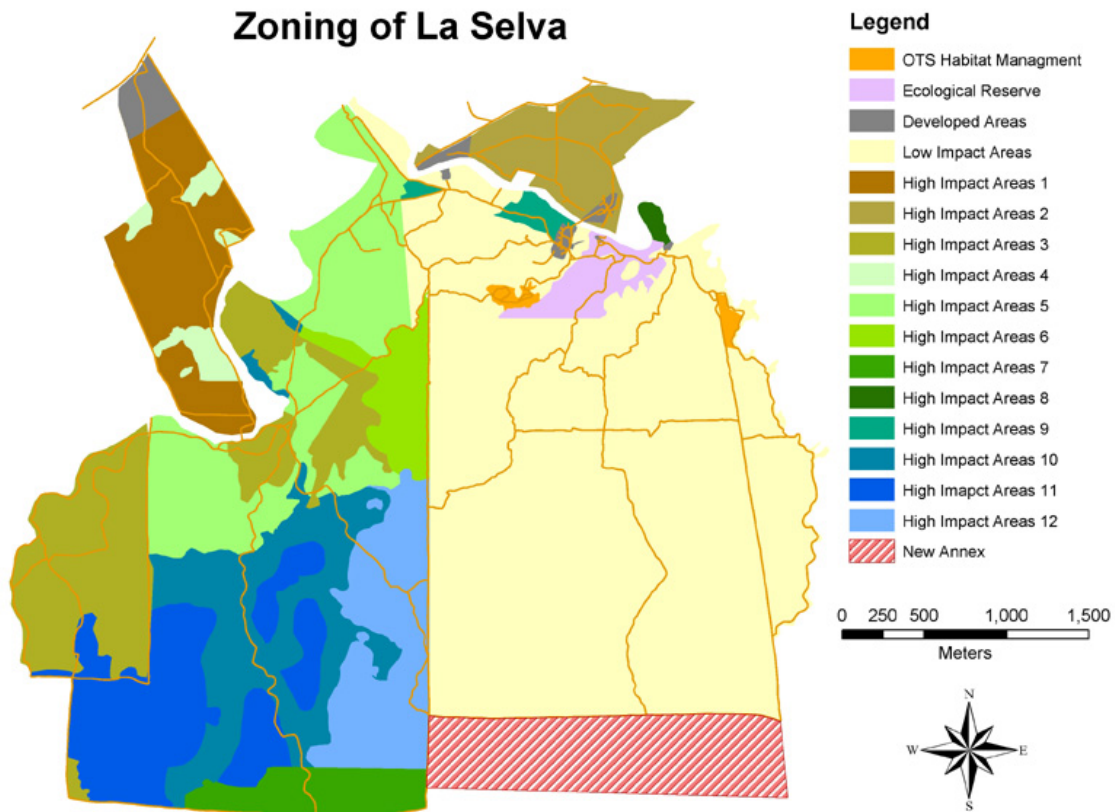
- Approved introductions of exotics will be allowed only outside Old La Selva and no species with an invasive history may be introduced. Permission to introduce congeners of such species may also be denied.
- In the case of plants known or believed to have long-distance pollen or seed dispersal, plantings must be outside a 400 m buffer zone beyond the primary forest of Old La Selva.
- Experimental introduction of seeds collected from within La Selva (in accordance with section III.D.5—Specific Regulations on Research—collecting seeds or seedlings in La Selva), are permitted in all areas of La Selva with approval of the Station Director (subject to 8 and 9 above). Seeds or seedlings must be removed when the research is terminated.
- If seeds for experimental introductions of native La Selva species are not available within La Selva in sufficient quantity, or if such species are too rare at La Selva, introductions of seed will be permitted on a case by case basis.
- All propagules collected outside La Selva must be both clean and intact before being brought onto Greater La Selva; such propagules should be inspected by the investigator and treated, if necessary, to prevent the introduction of pests and pathogens (see USDA guidelines). In general, non-sterilized soil may not be brought into La Selva on plant roots or otherwise; exceptions may be considered on a case-by-case basis, with appropriate precautions required.
- Introductions of exotic genotypes of species, and in some cases, congeners of species that could conflict with contemporaneous genetic studies at La Selva will not be permitted. Likewise, introductions of species that conflict with contemporaneous demographic studies at La Selva will not be permitted, unless it can be demonstrated that they can be removed before they could affect ongoing research.
- Regular monitoring to detect spread of exotic species will be carried out by OTS as well as by the researchers involved, at the researchers' expense. Researchers nevertheless must report to OTS any signs of spread from their plots. Monitoring of each introduction will be done at least annually by OTS personnel or consultants hired by OTS. For plantings this will consist of checks for flowering and/or fruiting and intensive surveys for seedlings or vegetative propagation in the 50 m wide annulus surrounding the planting. The frequency of monitoring will be determined on the basis of the proposal. Monitoring for the presence of propagation in and around the plot will continue for 2 years after the planting is removed. The projected cost of post-project

monitoring must be pre-paid by each project. Costs of monitoring are born by the investigator.

- Plantings must be removed (by OTS or the researcher, at the researcher's expense) at the prescribed termination of the project. If spread is detected during the project, the planting must be removed immediately. In this event, OTS will make every effort to advise the investigators before action is taken.
- Seeds and seedlings of exotic species under active consideration for outplanting may be maintained at La Selva only in containers in nurseries. Exotics not under active consideration for outplanting and not part of an approved research project will not be allowed in nurseries at La Selva.
- The Station Director may exempt cultivars that are already widely planted in Sarapiquí from the above requirements.

V. ZONING OF GREATER LA SELVA

Greater La Selva is divided into the zones described below. Decisions concerning research activities within these zones will carefully consider the value of (1) the proportion of different types of land-use (e.g., clear cutting, agroforestry plots, etc) within the zone and within the watershed in which they are located; (2) the impact of the project on present and future investigations; and 3) the environmental impacts of the project.



Rafael Chavarria Ecological Reserve

The boundaries of the Reserve are: the Quebrada El Salto, the Quebrada El Sura, the Rio Puerto Viejo, and Line 1000 of the original grid system (excluding only the immediate grounds of the River

Station). Within the Reserve, all area visible from established trails (but in all cases out 30 m from trails), is closed to access and is restricted to observational research only from the trails. Marking or modification of plants or animals within this viewshed is prohibited. Fallen seeds and fruits may be collected from trails, and animals may be picked up for identification if they are returned unharmed to the site of capture on the trail. Requests for one-time entry into the viewshed, or collection of specific organisms within the trail corridor proper, without entering trailside vegetation, may be granted by a letter from the Station Director in cases of extraordinary scientific value. This letter will record the exact location of the entrance. In the spirit with which the Reserve was established, extreme care must be taken to minimize all impact.

Requests for research in the non-viewshed areas of the Reserve will be reviewed by LSAC. Permission may be given for research that does not involve fixed access routes, frequently repeated and rarely visitation to specific sites, or irrevocable modification of the habitat or organisms. In addition, the research must be uniquely and significantly enhanced by use of the Reserve, and must not reduce the esthetic and historical value of the Reserve. Access to the non-viewshed area of the Reserve is not allowed through the viewshed.

Low Impact Areas

All types of research can be conducted in low-impact areas except for major habitat alteration at a scale greater than 100 m². Small long-term plots and small manipulations can be approved and sited by the Station Director. The low impact areas include:

1. **Old La Selva.** All the primary forest (592 ha).
2. **Old La Selva.** All the secondary forests outside the abandoned plantations (25 ha).
3. **Old La Selva.** All abandoned *Cordia*, pejibaye, and cacao plantations.
4. **Discovery Woods.** A small tongue of remnant mature alluvial forest just S. of Quebrada Leonel and NE of the Sendero Tres Rios).
5. **Stream Banks.** No forest removal will be permitted within 15 meters either side of stream channels.

High Impact Areas

High impact areas may be allocated to projects for habitat manipulation on a scale > 100 sq. m. Sites within this zoning category are ranked such that higher-ranking sites are allocated for manipulation only when lower-ranked sites are clearly demonstrated inappropriate for the project in question.

High Impact Area sites ranked from lowest to highest:

1. **La Guaria Annex.** All regenerating pasture land (ca. 82 ha) outside the development zone (the 9 ha closest to the highway).
2. **La Flaminea Annex.** All regenerating pasture land (55 ha.)
3. **Sarapiquí Annex and Peje Annex.** All regenerating pasture land (168 ha).
4. **La Guaria Annex.** All secondary forest (14 ha) outside of the development zone.
5. **Sarapiquí Annex.** All secondary forest in the northern half of the Annex, and west of the Q. El Carapa (ca. 65 ha).
6. **Las Vegas Annex.** Entire property (70 ha).
7. **Sarapiquí Annex.** Secondary forest east of the Q. El Carapa (ca. 25 ha).
8. **Sarapiquí Annex.** Secondary forest in the southern half of the Annex (ca. 45 ha).
9. **Old La Selva.** Clearing and second-growth on Rafael's Point, north of Line 600 (ca. 3 ha) but not including the immediate area of the garbage dump.
10. **Sarapiquí Annex.** The moderately-disturbed (high-graded) primary forest (114 ha).

11. Sarapiquí Annex. The undisturbed primary forest not contiguous with Old La Selva (ca. 103 ha).

12. Sarapiquí Annex. The undisturbed primary forest contiguous with Old La Selva (ca. 81 ha).

"Intensive treatment" projects (i.e. involving use of herbicides or large-scale use of fertilizers, extensive tractor use, or introduction of exotic plants or animals) will be sited on the La Guaria or La Flaminea Annexes. If special needs cannot be met on either the La Guaria or La Flaminea Annexes, siting on the Sarapiquí, Las Vegas, or Peje Annexes will be considered on a case-by-case basis, with review by LSAC.

OTS Habitat Management Areas

La Selva habitat management areas are sites managed by OTS and available for use by compatible research projects. They include

1. Old La Selva. Arboretum
2. Old La Selva. Successional plots (0.5 ha each), one of the 5 plots is cut each year to maintain early successional stages.
3. Trails. All maintained trails (cleared regularly within 1.5 m of either side of trail center)

Developed Areas

Developed areas are sites where buildings exist or are planned in the La Selva Site Plan. Perimeters are defined by the edge of all mowed areas in existing building sites, and by the mapped sites of future construction. In these areas, research is encouraged, but with the understanding by the researcher that site maintenance and human safety take precedence over research needs.

1. River Station site.
2. Pejibaye/lab clearing.
3. East Bank.
4. La Guaria development site (9 ha closest to the highway).
5. All developed facilities associated with the La Flaminea Annex Project.

VI. HABITAT MANAGEMENT AT LA SELVA

A. Areas of Secondary Succession

Five half-hectare parcels are permanently maintained by OTS in the early stages of secondary succession. These plots are intensively used by education groups and are frequently used by researchers. One strip per year is cut, with the result that at any time there are areas of vegetation from 0-5 years old. The strips are cut during the last week in February. Cut vegetation is left on the strips, no stumps are removed or poisoned, and the strips are not burned. No long-term data is being collected on the plots OTS, and no change in current management is anticipated. However, any proposal to modify current management practices would be reviewed by LSAC.

B. Pasture Management

There are currently 115 hectares of pasture in various conditions on the La Guaria, Sarapiquí, and El Peje annexes of Greater La Selva. Most of these areas are rapidly succeeding to early second-growth forest. There is currently no management of these areas as pasture. Pasture lands are assigned according to their zoning status, which usually will mean they are used for non-pasture purposes. OTS has assumed no long-term commitment to maintain pastures. If pasture is required for a given project, it will be the responsibility of the researchers involved to establish and maintain the pasture.

C. Holdridge Arboretum

The arboretum currently occupies 3.5 hectares and includes 1040 individuals of 262 species of La Selva trees. It is used extensively by courses, visitor groups, and researchers. Current management consists of regular brush cutting/mowing and irregular planting and retagging. The long-term goal for the arboretum is to have at least two individuals of all tree species at La Selva (460 species). It is probable that more space will be required to complete this task. Sections of the adjacent cacao groves will be converted to arboretum as this need develops. Each addition of area will be reviewed by LSAC. The current arboretum list is available to researchers in electronic form on the OTS website. The La Selva Naturalist is responsible for arboretum maintenance, which includes regular updating of the list and tags and grid maintenance. A system will be developed to label all trees with species and family names. No additional exotics will be introduced in the Holdridge Arboretum. The remaining original plantings of exotics there will be removed prior to reaching reproductive age.

The following exotics are currently in the Arboretum.

Prioria copaifera Exotic to La Selva, native to Costa Rica.

Hevea brasiliensis Brazil

Durio zibethianus Asia

Dinizia excelsa South America?

Dipterocarpus hasseltii Asia

D. Forestry Species Elimination TRIALS

Between 1987 and 1989 trials of 84 species (13 exotics and 71 natives) were established on one site in La Guaria, one in El Peje, and two sites in La Pelona. No management plan was ever developed for these plots; LSAC would consider management plans if they did not interfere with other uses, such as payment for environmental services.

E. CATIE Fuelwood Trials

In June 1984 the CATIE/AID Central American Fuelwood Project established trials of native and exotic tree species for fuelwood production, on the La Guaria Annex. They set up 2 replicates of multi-species plantings in the Nelder plot design. The individual species are identified with signs. CATIE terminated these trials in 1986. OTS has left the plots in place, but has carried out no maintenance on them. The continuance of these plots should be reviewed every two years by LSAC.

F. OTS/Costa Rican Forest Service "Canadian" Native Tree Trials

In November 1985, replicated plots of 14 tree species were established on the La Guaria Annex. Species include 1 species exotic to Costa Rica (*Terminalia ivorensis*), several species from other sites within Costa Rica, and several La Selva species. Regular site maintenance is carried out by OTS, and regular re-measurements are carried out by OTS/TRIALS. Data management and updated explanatory information are provided by OTS/TRIALS. A plan is needed to determine the long-term measurement protocol and the desired lifetime of the plots. The continuance of these plots should be reviewed every two years by LSAC.

G. OTS (TRIALS Project) Tree/soil Plots

In 1988-1989 12 ha of plantation were established on the Peje Annex, in order to study the long-term effects of different tree species on soil properties. The plantations are replicated plots of 5 nitrogen-fixing and 6 non nitrogen-fixing tree species, with a control treatment (undisturbed succession from pasture). Soil properties were measured before plantation establishment and are available for approved research. Tree growth is being monitored by the TRIALS personnel. These plot are currently the subject of active ecosystem research supported by the U.S. NSF Ecosystems Program.

H. Control of Invasive Exotic Species.

In addition to sections D-F, La Selva administration will develop and implement a plan to control exotic species occurring within Greater La Selva. This plan should be reviewed biennially by LSAC.

I. Trails

OTS will maintain a network of trails within Greater La Selva to: 1) provide access to the forest reserve for researcher and education; 2) project the reserve and reduce the impacts of visitation; and 3) provide efficient emergency evacuations. OTS also encourages the use of the reserve by the physically challenged and the use of bicycles in designated area and thus is committed to improving the network of bicycle and wheelchair accessible trails.

To maintain the integrity of the forest reserve it is also the policy to 1) locate and build new trails in a manner that minimizes damage to the reserve and long-term research sites; 2) close or modify trails that are rarely used; 3) only allow gasoline powered vehicles on the West Bank of LS in exceptional cases. As specific needs develop trails may be added or modified with approval by LSAC. LSAC will also develop a Master Plan as part of the Operations Manual. This plan will be reviewed by LSAC at least once every two years and will indicate trail specifications and the overall strategy for trail development within the reserve.

The LA trail plan will recognize three groups of trails: Class A trails; 1.2 m wide, concrete paved and graded trails that are accessible to wheelchairs, bicycles, and small electric golf carts. Class B trails; 60 cm wide concrete paved “sidewalks” that ascend steep places by stairs. These trails are generally unsuitable for any vehicles, including bicycles, because of steep descents or stairs. Class C trails: unpaved trails that have segmented boardwalks or stepping stones; Class D trails- unimproved trails, Class C and D trails are closed to bicycle use because of the potential soil and root damage from tires and because of their potential danger to riders.

The La Selva field crew clears vegetation along each trail as needed. Nevertheless, the goal is to remove as little vegetation as possible. Lianas, however, are left uncut; when crossing trails at < 2 m above the ground they are propped out of the way on supports (exceptions may be made by the station directors).

Researchers should not mark plants or plots that fall within trails, because trail maintenance, takes precedence over plot/plant designation in these areas and could eliminate marks.

Mitigation of Trail Use Impacts. The long-term strategy of the LS trail plan is to extend trail reinforcement roughly halfway to the Lindero Sur in Old La Selva and to pave the Camino Circular Cercano-Lejano loop, Sendero Holdridge, and Sendero Sarapiquí to increase access to these areas for research. The La Selva Trail Maintenance Plan proposes the following mitigation measures to the reduce impacts of trail use:

Class	Trail Mitigation Measure	Trails to be Improved
A	Concrete pavement to 60 cm width for pedestrians, 120 cm for bicycles.	CES, CEN, SCH, CCC, CCL, LOC 0-150, SUR. LOC 150-1450, SHO 50-760, SHA 0-553 (SSO 750), CC 0-315, SSO 0-1670 SSA 0-2869 (LS 3475)
B	Elevated walkways constructed of galvanized steel	SUA 0-908 (CC 318), shorter stretches of trail in low-lying muddy terrain in Old La Selva north of SUA, SHA and SSO.
C	Concrete stepping stones.	Trails south of SUA, SHA and SSO.
D	No reinforcement.	Remaining trails.

VII. INFORMATION MANAGEMENT

A. Maintenance of Collections at La Selva

Animals. Because of the cost of air-conditioned space, staff time, and materials, animal collections will not be maintained at La Selva by OTS. Researchers working on key animal groups will be requested to provide digital photographs of their groups; OTS will seek authoritative identification of the photographs and will incorporate these photographs into web-based identification guides.

Plants. The La Selva herbarium consists of standard mounted herbarium specimens and a collection of high quality photocopies of herbarium specimens from La Selva (now located in the Duke Herbarium). The Station Naturalist is responsible for maintaining and expanding this collection. Instructions for the use of the herbarium will be posted on the cabinets. Researchers will have free access to the specimens, unless restricted access is found to be the only means of preventing serious abuse of the collection. The herbarium will be regularly maintained by La Selva staff; damaged specimens will be repaired, the herbarium will be fumigated at least annually, and sheets with insect damage will be treated.

Climate Station Data. It is the responsibility of the LSSD to oversee operation of the La Selva long-term climate station and maintain and distribute high quality data to the public. Basic climate data should be available on the WEB and updated annually.

B. The La Selva Library

The purpose of the La Selva library is primarily 1) to make available published information about La Selva, and 2) to maintain a minimal collection of basic reference works on tropical science. A major goal is to minimize holdings at La Selva by taking maximum advantages of existing national and regional libraries, and by efficient use of remote-access informational databases.

The library collection will be maintained in the front section of the Orquídea Building by the Library Manager, with support from the CRO librarian. The book collections will be updated through donations of appropriate volumes on tropical biology, purchase of a few exceptionally useful books/year and inclusion of books received as review copies. Journals and other publications to be updated for the library are: Biotropica, Brenesia, Revista de Biología Tropical, Journal of Tropical Ecology, OTS course books and any publications relating to the La Selva flora and fauna. La Selva will maintain subscriptions to Science, but these journals will be sent to the University of Costa Rica after 3 months, and will not be stored in the library. The electronic listing of the library contents is maintained up to date and made available to researchers and students via a computer in the library and the CRO library contents are also posted on the La Selva website. Decisions about further expansion of the library will be made after consultation with LSAC.

Each researcher carrying out thesis research at La Selva is required to donate three copies of their thesis to OTS, while other researchers must deposit three reprints of all publications resulting from La Selva research with OTS.

C. Imagery

A complete set of existing aerial photographs of La Selva and environs will be obtained from the Costa Rican National Geographic Institute (Instituto Geografico Nacional) and will be filed at La Selva. To establish baseline images for detection of future changes, the La Selva GIS Manager will maintain concurrent sensing scenes of La Selva and vicinity from the major available satellite platforms for which there is not continuous archiving (IKONOS or QUICKBIRD and ASTER) as soon as is feasible, preferably within the next year and will obtain such images or their equivalents at two year intervals in the future.

D. Lists and Keys of La Selva Flora and Fauna

The most recent species lists for La Selva organisms are posted on the OTS website. Keys, when available in electronic form are also posted on the OTS website and otherwise, are housed in the La Selva library. Copies of the most recent versions are made available to researchers on request.

E. Researcher Responsibility for Metadata and Data Deposition with OTS

1. Station Data Management Policy. This Operations Manual summarizes the key points of La Selva data management policy and regulations. More detailed information is contained in the documents *La Selva Data Management Policy* and *La Selva Data Management Procedures*, also available in English and Spanish on the OTS website and from the Station Director on request.

2. Metadata Deposition. As a condition of research approval, La Selva Database Management Policy establishes that researchers must submit metadata on their research to OTS and update these metadata as datasets change over time. At the time of project approval, investigators must acknowledge these requirements, in written or electronic correspondence to the Station Director. Instructions for metadata submission and curation may be found in the *Instruction Guide for the Completion of Metadata Fields*, posted on the OTS website and also available from the La Selva Station Director. At departure, all researchers will be reminded of the requirement to submit metadata for data sets generated during their visit. At that time, researchers should also review and update the metadata of previously collected datasets that may have changed since submission.

3. Deposition of Data. OTS may also request that researchers deposit datasets of wide utility to the La Selva research community with OTS. Obligation to deposit such data will be determined by the La Selva Station Director as part of the project approval process. The project principal investigator(s) may elect to restrict access to these data for five years. Access restriction may be extended beyond five years with approval of the Station Director.

F. Informing Researchers of Data Availability

Metadata are information pertinent to datasets gathered in La Selva research and items such as the author of the dataset (PI of project that collected the data), the title and nature of the project, key words, source of funding, descriptions of each dataset collected in the project, their format (.txt, EXCEL, ACCESS, etc.) and size (MB). Metadata constitute the core of La Selva's institutional memory and are indispensable for reporting research productivity to the US National Science Foundation and other funding institutions, as well as for providing information to researchers on the legacy of research conducted at the station.

Over 140 metadata records on research projects at La Selva had been collected and archived as of January 2002. All of these metadata are publicly accessible and searchable at www.ots.ac.cr/en/rdmcnfs/metadata.shtml. La Selva meteorological and bibliographic data may also be found on the OTS website.

G. Records of Research and Researchers at La Selva

Incoming researchers will be asked to provide information on their project upon arrival. These data will be used to update an electronic listing of research activity at La Selva viewable on the OTS website. Project listings will be key-worded for retrieval by subject.

VIII. POLICY FOR SUPPORT AND MANAGEMENT OF EDUCATIONAL USE OF LA SELVA

A. Informing Educational Groups of On-site Regulations.

Educational groups are advised of La Selva regulations and procedures in the User's Guide to La Selva and in other documents sent at the time reservations are made. Upon arrival at the station, they

are advised of station regulations and policies by the La Selva academic groups coordinator and presented with a printed version of the information pamphlet. Education group coordinators are also required to sign a form indicating they have received and understand LS policies. The information pamphlet is considered to be part of the Operations Manual, and thus subject to biennial review by LSAC.

B. University Courses in Tropical Science

1. Orientation to La Selva. Upon arrival at the Station, courses are advised by the LSSD or designated member of the scientific staff of potential conflicts with research projects and they are also referred to the User's Guide to La Selva. They are required to consult with the Station Director or designated member of the scientific staff about all non-observational research projects. An effort is made to concentrate manipulative course projects in the more areas set aside for such activities, such as the successional strips and the secondary habitats in the Sarapiquí Annex. Manipulative projects in the primary forest of Old La Selva are discouraged, unless they are proposed as part of a longer-term study involving a follow-up visit and will require LSAC approval. Courses will also be asked to respect the privacy of the Station residents.

2. Course facilities at La Selva. The primary course meeting and laboratory space is the Academic Center. Courses are expected to be self-sufficient with respect to equipment and supplies. OTS, whenever possible, will furnish basic laboratory equipment for the academic center including microscopes, computers and simple laboratory equipment. With the approval of the La Selva Lab manager and LSSD, courses are also permitted to use more specialized scientific equipment housed in the research laboratories, contingent upon student experience and supervision. Course coordinators should make arrangements for use of research laboratory and equipment with the Laboratory Manager. Access to the research laboratory computers is provided to courses on a case-by-case basis, according to course needs and requests and the existing researcher and administrative needs.

IX. SAFETY

Maintaining a safe environment for visitors and staff at La Selva is a top priority and the responsibility of everybody at the station. In general, the LSSD is responsible for all aspects of safety that are related to the research endeavor while the LSAD is responsible for the safety of facilities and administrative staff functions. A copy of the Safety Procedures is posted in the laboratories and classrooms and is available online.

Snakes: All visitors must receive basic orientation to dangerous snakes at LS to the extent they can: 1) identify common dangerous snakes; 2) know standard precautions; 3) know what to do in case of a snake bite.

Trail use: Everybody should be informed of basic safety behavior when using trails; including:

Bike riders; slow speeds, signal to pedestrians

Pedestrians; allow space for bikes and when trails are being used to transport materials

Tour groups – guides should be asked to insure tour groups maintain space on paths for people and bikes to pass

Laboratory Safety: Responsibility of LSSD, as delegated to the LS Laboratory Manager, to insure that the laboratory facility is operated and maintained in a safe manner: Chemical storage, Proper use of equipment, Safety equipment in lab

Emergency procedures and contacts: Procedures, Emergency numbers posted on every telephone

Documents referred to in this Operational Procedures Manual

User's Guide to La Selva (English and Spanish versions)

La Selva Data Management Policy

www.ots.ac.cr/en/laselva/datamanagement/polit.shtml

La Selva Data Management Procedures

www.ots.ac.cr/en/laselva/datamanagement/datamanagement.html#3-1

Instruction Guide for the Completion of Metadata Fields

www.ots.ac.cr/rdmcnfs/guiamd

Safety Procedures