



Peru Schools' Booklet 2018

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1. Study area and research objectives

The Amazon rainforest represents the largest rainforest on Earth, and encompasses seven million km² across nine South American countries (Brazil, Peru, Colombia, Venezuela, Ecuador, Bolivia, Guyana, Suriname and French Guiana). Amazonian biodiversity is reportedly higher than anywhere else in the world and contains approximately 2.5 million insect species, 40,000 plant species, 3,000 fish species, 1,294 bird species, 427 mammal species, and 807 species of herpetofauna (reptiles and amphibians).

The study site of the Operation Wallacea surveys is an area of seasonally flooded forest that connects the Pacaya-Samira National Reserve and the Tamshiyacu-Tahuayo Community Reserve. These reserves span over 20,000 km² of tropical rainforest and teem with aquatic and terrestrial life. The surveys will be conducted from a site on the banks of the Lower Yarapa river, which is a 50 km long channel that originates in the Ucayali river (which itself borders the Pacaya Samira Reserve) and discharges into the Rio Amazonas (River Amazon). The flooded forests (várzea) of this landscape are particularly susceptible to global climate change which appears to be increasing the frequency of extreme flooding events and low water periods. During the height of the annual floods, much of the varzea area is flooded, but this can be as high as 98% in extreme flooding events, confining land-based mammals (agouti, deer, peccaries, armadillos and tapir) to small areas of land and thereby significantly impacting their population levels. In times of extreme low water, fish populations and their associated predators (dolphins, river birds and caimans) are under stress. The datasets managed by Fund Amazonia for this landscape, which is based on the annual surveys completed by the Opwall teams and others, are the most extensive in any of the Peruvian reserves and is showing the impact of global climate change on a range of taxa and on the livelihoods of indigenous people. This information is being used to make management decisions for the reserves and policy decisions for conserving the Peruvian Amazon including hunting quotas for the indigenous communities (see <https://fundamazonia.org/peccary-pelt-certification.html>).



Figure 1. Location of the survey site

2. Itinerary

The students will be based on research ships in the Tamshiyacu-Tahuayo Reserve for the whole two-week period. During this time, the students will be rotating around the various research projects to gain experience and will have a series of lectures and discussion sessions on Amazonian Wildlife and Conservation.

Students will have the opportunity to take part in 10-11 research projects over the two weeks (terrestrial transects for large mammals and game birds, macaw point counts, dolphin and turtle transects (note the turtle element of these surveys depends on water levels), caiman population surveys, habitat surveys, wading bird surveys, understorey bird population surveys, fish population surveys, fishing bat surveys, amphibian surveys and butterfly and moth surveys). Students will be split into groups of 6 – 8 people depending on the activity and will have the opportunity to rotate around the different projects over the course of their time on site. Each student will be expected to join one of the morning and one of the afternoon or evening activities and to participate in data entry. In addition, there will be eight lectures with discussion topics/activities delivered during the first two days of the expedition and at times of day when there are no field practicals running.

In addition to the lectures and field practicals each of the students will be asked in groups to complete the background research on a relevant topic and on the return journey at the end of the expedition will be asked to give a short presentation to the other groups on the boat. Time is available between practicals and in the evening to complete the background research on these questions and prepare the presentations. The presentations are done in small groups although if CoPE is being done then the presentations have to be done individually.

Table 1. Indicative timetable for those based in Tamshiyacu-Tahuayo. Note there may be changes depending on the total number of students, fitness of students, weather conditions, water levels or operational problems.

Time	Activity
Sunday pm	Lecture 1: Amazonian Bio-geography
Sunday eve	Health and safety briefing
Monday pm	Lecture 2: Ecological Census Techniques
Monday eve	Documentary Film
Tuesday am	Lecture 3: Introduction to Amazon Biodiversity
Tuesday pm	Lecture 4: Classification and Neotropical Birds
Tuesday eve	Briefing: Risk Assessment for Field Activities
Wednesday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understorey birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Wednesday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understorey birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Wednesday eve	Lecture 5: Samiria Herpetofauna
Wednesday night	Caiman/amphibian surveys for a small group

Thursday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Thursday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Thursday eve	Lecture 6: Samiria Mammals
Thursday night	Caiman/amphibian surveys for a small group
Friday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Friday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Friday eve	Lecture 7: Amazon Fisheries
Friday night	Caiman/amphibian surveys for a small group
Saturday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Saturday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Saturday eve	Free evening
Saturday night	Caiman/amphibian surveys for a small group
Sunday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Sunday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Sunday eve	Amazon Ecology Quiz
Sunday night	Caiman/amphibian surveys for a small group
Monday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Monday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Monday eve	Film night
Monday night	Caiman/amphibian surveys for a small group
Tuesday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Tuesday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Tuesday eve	Guest lecture by academic
Tuesday night	Caiman/amphibian surveys for a small group
Wednesday am	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Wednesday pm	Surveys on macaws, large mammals & game birds, dolphins, wading birds, understory birds, habitat surveys, Amazonian fish, fishing bats & amphibians.
Wednesday eve	Preparation for evening presentation
Thursday am	Depart field site. Lecture 8: Conservation Synthesis.
Thursday pm	Visit to Indigenous Cocama Community
Thursday eve	Group Presentations

Friday am	Feedback forms and debrief
Friday pm	Return to Iquitos

3. Lectures

Lecture 1: Amazonian Biogeography

- Formation of the Amazon
- Lake of Pevas
- Seasons of the flooded forest
- Amazonian River Systems
- Habitats of the Flooded Forests
- The flooded forest and animal adaptations
- People and agriculture of flooded forests
- Terra firme or upland forests
- Wildlife of upland forests
- People and agriculture of upland forests

Discussion topic/Activity – Why are there so many species in the Amazon?

Lecture 2: Ecological Census Techniques

- Sampling methods
- Replication
- Mark recapture methods
- Distance Sampling
- Each of the surveys of the expedition, the methods and their importance

Discussion topic/Activity – Discussion on sustainable conservation

Lecture 3: Introduction to Biodiversity

- What is biodiversity?
- Different scales of diversity
- What is a species?
- Measuring diversity
- Diversity gradients
- Is biodiversity important?
- Amazonian Biodiversity
- IUCN Red list, biodiversity Hotspots

Discussion topic/Activity – International Year of Biodiversity, 2010.

Lecture 4: Neotropical Birds

- Bird diversity
- Large game birds – Curassows, guans, etc
- Humming birds
- Toucans
- Macaws and other parrots
- Ecological interactions
- Conservation issues
- Bird identification and survey techniques

Discussion topic/Activity – Bird identification task

Lecture 5: Herpetofauna

- Herpetofauna diversity
- Amphibians (Caecilians, salamanders, frogs and toads)
- Chytrid Fungus
- Reptiles (Turtles, crocodile, lizards and snakes)
- Snake fang morphology and associated venoms
- Conservation issues
- Survey techniques

Discussion topic/Activity – Which is better: in-situ or ex-situ conservation?

Lecture 6: The mammals of the Amazon:

- Comparing neotropical mammals to those of the temperate zones
- Aquatic mammals of the Peruvian Amazon (giant river otters and pink and grey river dolphins)
- Felids of the reserves
- Primates of the reserves
- Anteaters, sloths and armadillos
- Forest ungulates
- Feeding ecology
- Population monitoring and methods

Discussion topic/Activity – Camera trap ID test

Lecture 7: Amazonian fisheries

- Fisheries Management
- Amazonian Fisheries
- Species richness
- Piranha
- Electric eels
- Arapaima
- Fish survey techniques, gill nets, traps, rotenone, long lines

Discussion topic/Activity – Fish identification quiz

Lecture 8: Conservation synthesis

- What is conservation?
- Conservation organisations
- Conservation strategies
- Conservation management strategies in the area

Discussion topic/Activity – Round up of the weeks work and the contributions they will make.

4. Biodiversity practicals

In the study site (working in groups of 6 - 8) students will complete the following field practicals:

Macaw Surveys: 5:30am – 9:00am and 4:00pm – 6:00pm

Point counts are used to monitor macaws. Eight or nine sample points have been identified at each site with each sampling points separated by 500m. Fifteen minutes will be spent at each point with censuses carried out twice a day; in the morning and afternoon. Within the fifteen minute counts, all macaw species either perched or flying will be noted and the time of observation and distances of the birds from the observer will be estimated where possible. Abundance data for each sample point over the various replicates will be calculated. Identification cards will be available.

Primate, large mammals and bird transects: 7:00am – 12:00pm and 2:00pm – 5:00pm

Transect trails are being used to conduct terrestrial mammal surveys. Census trails between 2-5 km in length are surveyed repeatedly at each of the three sites. Information registered on a census includes: day, site, species, number of individuals, and perpendicular distance from the individual to the transect line, habitat, time, distance traveled and weather conditions. The method and theories behind distance sampling will be explained to students and they will be taught how to recognise different species and the main identification features will be explained. Identification sheets will be available.

River Dolphin Transects (includes turtles when river levels are appropriate): 9:30am – 12:00pm and 2:30pm – 5:00pm

Five kilometer transects at each site will be travelled twice daily along the centre of the river using a boat. Information to be collected includes: species, group size, group composition, behaviour (travelling, fishing, playing), time, and any additional observations. During these surveys students will be taught how to record the distribution and behaviour of both pink and grey river dolphins.

A motorized boat will be used to carry out the census. Any dolphins seen coming to the surface for air, swimming with their heads above water or swimming just below the surface of the water (i.e. no deeper than 5 cm) will be recorded with care being taken not to double count any dolphin sightings. Note: when the water levels have dropped enough during our season then the surveys will also include turtles. The method consists of travelling with the current of the river on a boat and registering the number of individuals sighted, either sunbathing or swimming. The censuses are carried out at the same time as dolphin transects, collecting data on the perpendicular distance, the number of individuals, the location of the boat, the activity of the species and any other information deemed relevant. The classification of the microhabitat will be recorded. Students will be taught how to differentiate between the 2-species found in the reserve. Identification cards will be available.

Fish Surveys: 9:30am – 12:30pm and 2:30pm - 5:30pm

Students will be able to witness and learn how gill-net surveys are implemented. They will also take part in surveys using fishing lines. Any fish caught will be measured, weighed and identified. Students will learn how to identify different species using identification guides. The rationale for gill net and line use is to simulate, as closely as possible, the potential pressures of local and commercial fishers, rather than to provide a comprehensive survey of fish diversity.

Habitat surveys: 9:30am – 12:30pm and 2:00pm – 5:00pm

The first part of this survey is to teach the students about the different habitat types found within the reserve, explaining the different flora and how they are used by the local people. The second part is designed to

produce quantitative data on the various forest habitats (e.g. size structure and biomass of trees, levels of light penetration and ground vegetation and regeneration rates). 20m x 20m quadrats are set up in the different habitat types and various different measurements within the quadrats are taken using a range of equipment including a canopy scope, clinometer, measuring tape and touch pole.

Wading Bird Surveys: 6:00am – 9:30am and 4:00pm – 6:00pm

One of the main conservation reasons for protecting the Tamshiyacu-Tahuayo Reserve is the large wading bird communities that use the Samiria river. These populations will be surveyed using 3-5km long boat-based transects. The boat engines will be turned off and the boat allowed to drift down river in the middle of the channel. All waders, ducks, kingfishers and terns will be identified and counted along the transect in divided 500m sections. This survey will depend on water levels and time at research station.

Understorey Birds: 5:45am – 12:00pm and 2:00pm – 5:00pm

The use of mist nets allows for quantitatively reliable data to be produced for tropical understorey birds, allowing for the identification of birds that are shy or seldom vocal, minimises observer bias and produces results that are easily repeatable. Suitable sites for the nets will be chosen in areas where there is thick undergrowth vegetation, ten mist nets 2.5-meter-high to be placed at each site 20 meters away from each other. Each site sampled will consist of a single forest type (eg. varzea, terra firme). The nets will be checked every 20 minutes for birds throughout the day. When birds are caught they will be taken out of the net, each bird will be identified, ringed, weighed and standard morphological measurements taken.

Fishing bat surveys: 6:30pm – 7:30pm

This river survey involves travelling along the river for a 1-hour period during dusk recording the number of fishing bats seen flying over the river. The students will also use a batbox (ultrasonic bat detector) to help detect and identify the bats. The purpose of this survey is to use the fishing bats as an indicator of small fish populations.

Nighttime amphibian floating vegetation surveys: 8:30pm – 11:30pm

This survey will be conducted at night during the period when amphibians are most active. An auxiliary boat is driven into a raft of floating vegetation and students spend 15 minutes searching for amphibians within 2m around the boat. Upon detection and capture of an individual each specimen will be handled carefully and morphological measurements taken. Amphibian species are used as biological indicators and the survey identifies species using the floating vegetation as breeding platforms.

Night time caiman surveys: 8:30pm – 11:00pm

This practical will involve spotlight surveys of the river after dark to locate and identify caiman species in order to estimate population size and distributions. Noosing will be used to capture caimans so as to obtain various morphological measurements, sex and an estimate of age.

Community Visit

This practical session will expose the students to the way of life in an indigenous Cocama community. The group will have the chance to see local houses, buy local handicrafts and maybe even take part in a football game against the locals. You might want to bring some small gifts to donate to the local school and children.

5. Learning objectives

By the end of the expeditions the students should be competent to do the following:

- To explain why the Amazon is so species diverse
- To describe survey methods and their disadvantages for a range of river and forest taxa
- Be able to identify 10 species of Amazonian bird
- Be able to identify 10 species of fish or reptile
- Be able to identify 10 species of mammals found in the forests
- Be able to identify the 3 species of caiman found in the Reserve
- To describe how community based conservation can contribute to saving the Amazon forests

6. Research contribution

Conservation strategies must include wildlife monitoring to determine if they actually work and are therefore key elements of any conservation work. The wildlife monitoring conducted by Operation Wallacea in the Tamshiyacu-Tahuayo National Reserve is helping to evaluate the success of conservation strategies in an effort to promote good conservation practices throughout large areas of the Amazon basin. The project has already helped convince the Peruvian and Brazilian governments of the advantages of community based strategies resulting in the recent creation of seven new community based protected areas in the Peruvian Amazon. The wildlife monitoring measures the success of community based strategies for biodiversity conservation and helps convince the government of the importance of these strategies for both the local people and the biodiversity. The impact of climate change is becoming more intense with greater flooding and more intensive droughts. The impacts of these more extreme conditions on wildlife are being monitored by the project and recommendations on how to cope with these changes are being made to the local people, the reserve management and the Peruvian government.

Long-term data sets collected from terrestrial transects are used to determine the impact of hunting on primates and ungulates. River dolphins are used as an indicator species for aquatic systems and macaws as indicators for terrestrial systems. By the long-term assessment of changes in species numbers and behaviour we can evaluate the recovery of both ecosystems. The data collected from caiman surveys allows the recovery of black caiman populations to be determined and ecological interactions between the three species elucidated. River turtle population data are used to determine the success of the Headstarting Conservation Programme (creation and protection of artificial hatcheries) in the Samiria River basin. The fish and fishing bat surveys allow data to be collected on abundance, diversity and age structure of fish species, which are used to determine the impact of local fisheries and the effectiveness of fisheries management.

7. Links to A levels

The following table below highlights how your Opwall expedition relates to the AS and A level syllabuses across all exam boards. The red and blue blocks indicate that the keywords listed are covered on our expedition (through lectures, practicals or in discussion topics) and that these keywords are also within AS or A level topics as shown.

Topic	Biology	AQA	C	CCEA	C.Int	Ed/Sal	OCR	SQA	WJEC	AP	IB					
	Levels: S=AS 2=A2 H=Highers	S	2	S	2	S	2	S	2	H	A	S	2	H		
Evolution, Classification and DNA	Evolution; Speciation; Species; Endemism; Gene pool; Allopatric; Sympatric; Isolation; Variation; Adaptive radiation Adaptation; Wallace; Darwin		◆	◆		◆	◆		◆	◆		◆	◆	◆		
	Classification; Taxonomy; Binomial system; Dichotomous Keys	◆		◆		◆	◆			◆		◆		◆		
	PCR; Genome sequencing; Genetic fingerprinting; DNA profile		◆	◆	◆			◆	◆			◆	◆	◆		
Ecology and Ecosystems	Ecology; Habitat; Niche; Abiotic; Biotic		◆	◆	◆		◆	◆	◆				◆	◆	◆	
	Biome; Ecosystems; Rainforests; Deserts; Coral reefs; Mangroves; Marine; Coasts; Hot arid; Semi-arid; Woodland Bush; Tropics; Tropical		◆	◆		◆	◆			◆			◆	◆	◆	
	Populations; Competition; Interspecific; Intraspecific; Predator Prey; density dependent; independent: Symbiosis		◆	◆		◆	◆			◆			◆	◆	◆	
	Succession; Climax community		◆		◆			◆	◆	◆			◆		◆	
	Biodiversity	◆		◆	◆		◆	◆	◆			◆		◆	◆	
	Practical work; Field techniques; Ecological sampling; Random sampling; Transects; Capture, mark, release and recapture; Biodiversity indexes; Data handling and; presentation; Quadrats; Statistical testing; Measuring; GIS; Research tools		◆	◆		◆			◆	◆	◆			◆	◆	◆
	Written reports; Research project; Report; Case studies			◆				◆		◆			◆	◆	◆	
Agriculture, Human activities, Conservation and Sustainability	Sustainability	◆		◆			◆	◆	◆				◆		◆	
	Agriculture; Agricultural impact; Agricultural exploitation; Cultivation crops; Food production; Sustainable agriculture; Sustainability; Forestry; Timber; Deforestation; Fisheries; Over fishing; Deforestation; Human management; Human effects; Human activities	◆			◆				◆	◆				◆	◆	
	Fair-Trade; Coffee; Rain Forest Alliance; Ecotourism; Tourism; Carbon trading; Greenhouse gas emission control (REDD)												◆			
	Indicator species; Pollution; Climate change; Global warming Carbon footprint; Fossil fuels		◆	◆		◆		◆	◆			◆		◆	◆	
	International conservation; Endangered species; Invasive species; Biological control; Pests; CITES; Ethical, Local; Global	◆	◆	◆		◆			◆	◆	◆			◆		◆
	National Parks; Wildlife reserves					◆									◆	
	Environment; Environmental monitoring; Environmental impact; SSSI															
Behaviour	Animal behaviour; Primate Social behaviour; Courtship; Territory; Co-operative hunting; Herbivores; Grazing	◆		◆	◆		◆		◆	◆	◆		◆	◆	◆	

Table: Highlighted in Black are topics that you might experience at your research site. Key: C = Cambridge. Pre-U, C.int = Camb. Int. CCEA = N.Ireland; Ed/Sal = Edexcel Salters, S= SQA ; Edex = EdExcel; IB = International Bacc; AP=Advanced Placement (v. 20/11/14)

Topic	Geography, APES and ESS	IB ESS	APES	AQA		CCEA		Edex		OCR		WJEC			
				Geography											
				S	2	S	2	S	2	S	2	S	2		
Evolution, Classification and DNA	Evolution; Speciation; Species; Endemism; Gene pool; Allopatric; Sympatric; Isolation; Variation; Adaptive radiation Adaptation; Wallace; Darwin														
	Classification; Taxonomy; Binomial system; Dichotomous Keys	♦													
	PCR; Genome sequencing; Genetic fingerprinting; DNA profile														
Ecology and Ecosystems	Ecology; Habitat; Niche; Abiotic; Biotic	♦	♦							♦					
	Biome; Ecosystems; Rainforests; Deserts; Coral reefs; Mangroves; Marine; Coasts; Hot arid; Semi-arid; Woodland/Bush; Tropics; Tropical	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		
	Populations; Competition; Interspecific; Intraspecific; Predator Prey; density dependent; independent; Symbiosis	♦	♦												
	Succession; Climax community	♦													
	Biodiversity	♦	♦		♦			♦							
	Practical work; Field techniques; Ecological sampling; Random sampling; Transects; Capture, mark, release and recapture; Biodiversity indexes; Data handling and; presentation; Quadrats; Statistical testing; Measuring; GIS; Research tools	♦	♦		♦	♦		♦		♦	♦	♦			
	Written reports; Research project; Report; Case studies	♦	♦		♦		♦	♦		♦	♦				
Agriculture, Human activities, Conservation and Sustainability	Sustainability	♦	♦		♦		♦			♦	♦				
	Agriculture; Agricultural impact; Agricultural exploitation; Cultivation crops; Food production; Sustainable agriculture; Sustainability; Forestry; Timber; Deforestation; Fisheries; Over fishing; Deforestation; Human management; Human effects; Human activities	♦	♦		♦		♦								
	Fair-Trade; Coffee; Rain Forest Alliance; Ecotourism; Tourism; Carbon trading; Greenhouse gas emission control (REDD)						♦	♦		♦	♦		♦		
	Indicator species; Pollution; Climate change; Global warming Carbon footprint; Fossil fuels	♦	♦				♦	♦		♦					
	International conservation; Endangered species; Invasive species; Biological control; Pests; CITES; Ethical, Local; Global	♦			♦					♦					
	National Parks; Wildlife reserves								♦						
	Environment; Environmental monitoring; Environmental impact; SSSI														
Behaviour	Animal behaviour; Primate Social behaviour; Courtship; Territory; Co-operative hunting; Herbivores; Grazing														

Table: Highlighted in Black are topics that you might experience at your research site. Key: C = Cambridge. Pre-U, C.int = Camb. Int. CCEA = N.Ireland; Ed/Sal = Edexcel Salters, S= SQA ; Edex = EdExcel IB ESS = Env Systems and Societies; APES = Advanced Placement Env. Science (v. 20/11/14)

8. Reading and research questions

Many students are now involved in producing Independent Research Projects (IRP) as part of their 2-year educational programme and many hope to carry this out whilst on an Opwall Expedition. If you are an IB school, you will be involved in the EE or Extended Essay or if in the UK an EPQ or Extended Project Qualification. Those involved in CoPE will also have a similar task in which they carry out some research. There are many similar projects in most countries.

One of the key features of all of these 'Essays' or 'Projects' is that you have to choose your own research question. To help in this, please do have a look at the example research questions available on our website: <https://www.opwall.com/schools/educational-benefits/independent-research-project/>.

This booklet also contains detailed information on the research projects you will be involved in and this may help you to locate your particular area of interest.

The type of IRP will vary but it is less suitable for individual investigations where you collect your own primary data although in some cases you might be able to get hold of raw data and you will often have the opportunity to help collect some of this data yourself. You will certainly have the opportunity 'on-site' to meet up with the scientists involved which will allow you to get a deeper insight into your research question.

The Wallace Resource Library (WRL) contains many datasets based around the research being carried out and it has been prepared by the actual Opwall scientists involved. It is a very valuable source of ideas with comprehensive datasets to look at and study.

Demo version – <http://wallaceresourcelibrary.com>

Do also make use of the research library on the Opwall website – <http://www.opwall.com>

How does it work?

Once you have an idea send an email to schoolresearchprojects@opwall.com with your initial ideas and contact details so that one of the academic staff working with Opwall can contact you to discuss possible research questions. We can also send you further information to help you choose a suitable title for your research site.

Once you have decided on a title you will then be asked to complete a registration form (supplied on request) which we can then forward to the appropriate country manager or scientist. This will then inform those at the research site about what you are hoping to achieve plus for us to give you as much assistance as we can.

In some cases, we will also be able to provide you with data sets from previous years which some students will find very useful.

Deadlines

Although each school will be operating their own schedule we would like registrations to be completed at least 3 months before their expedition begins although the earlier the better.

Books

Pearson DL, Beletsky LD and Barrell P (2004) Peru (Travellers' Wildlife Guides) Interlink Books.
Stotz DF, Schulenberg TS, O'Neill JP, Parker TA (2007) Birds of Peru (Helm Field Guides) Christopher Helm Publishers Ltd.

Kricher J (1997) A Neotropical Companion Princeton, University Press

Sutherland WJ (2006) Ecological Census Techniques: A Handbook (2nd Edition). Cambridge University Press, Cambridge.

Dr Bodmer interview:

<http://www.telegraph.co.uk/earth/wildlife/8114754/Pink-river-dolphins-at-risk-from-drought.html>

Research areas and activities being carried out in Peru:

- Assessing changes in bird communities in the Tamshiyacu-Tahuayo Reserve, Peru
- Macaw Surveys: Boat based point counts are used to monitor macaws with each site separated by 500m. Indicator species for forest fruiting.
- Wading bird surveys: Boat based surveys - subsections where all river edge bird species are recorded
- Understorey birds: mist nets are set at replicate sites in a range of habitats (riverine forest, closed canopy forest, tree fall gaps, levees, liana forest, palm forest) – data used to identify population trends
- Habitat surveys: These surveys are designed to produce quantitative data on the various forest habitats (size structure and biomass of trees, canopy cover, levels of light penetration and ground vegetation, regeneration rates).
- Fish Surveys: setting standard gill nets to quantify the catch per unit effort experienced by the Cocama Indians.
- Fish community usage of different habitats in the Peruvian Amazon
- The role of floating vegetation mats in the Tamshiyacu-Tahuayo Reserve, Peru in providing breeding habitat for amphibians
- Niche separation in caiman species, Peru
- Turtle monitoring: (2 species) method consists of registering the number of individuals sighted, either sunbathing or swimming
- Night time caiman surveys: locate and identify caiman species in order to estimate population size and distributions. Noosing is used to capture caiman.
- Population trends and habitat preferences of Pink and Grey River Dolphins in the Peruvian Amazon
- Changes over time in ground dwelling and arboreal mammals in the Tamshiyacu-Tahuayo Reserve as a result of changes in flooding frequencies and heights and hunting pressure
- Transect surveys: Large mammals, primates and game birds - camera trapping and patch occupancy data. – calculate density levels for sustainable hunting.
- River Dolphin Transects: record the distribution and behaviour of both pink and grey river dolphins
- Niche separation in Tamarins, Howler Monkeys, Squirrel Monkeys and other primates in the Peruvian Amazon