



Croatia Schools' Booklet 2018

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1. Structure of the Croatian Expedition

This expedition combines a week working in the spectacular Krka National Park and a second week on Mljet Island in southern Dalmatia off the coast of Dubrovnik. The Krka National Park, lying only a short drive from the coastal city of Split, surrounds the middle-lower course of the Krka River, as it runs through limestone karst valleys on a steep gradient towards the Dalmatia coast. The island of Mljet, which has a population of just 800 people, is the oldest marine national park in Croatia and can be accessed via ferry from the cities of Split and Dubrovnik.

Groups will fly into the city of Split and take a bus straight from the airport to the Krka National Park, where they will be based in a village on the edge of the valley, Kistanje. Accommodation will be in dorm rooms or tents. After a week in Krka, where the students will work on a mixture of research projects focused on the unique fauna of the forests, caves, river valleys and rivers of the park, the groups will go back to Split and take the ferry to the island of Mljet. In Mljet the groups will spend a week learning to dive, participating in an Adriatic marine ecology course and participating in several marine research projects. After this week, they will take the ferry from Mljet to Dubrovnik, from where they will fly home (see figure 1).



Figure 1: Map of Croatia showing the locations of Split, Krka, Mljet and Dubrovnik.

2. Week 1: Krka National Park

The high Dinaric Arc mountains which run along the border of Bosnia and Croatia separate much of the European continental fauna from the Mediterranean fauna of coastal Croatia. The Krka River in only 60 km runs from the high Dinaric mountains down to the sea and contains an excellent example of this speciation gradient. The National Park is rich in freshwater biodiversity because of the long geographical isolation of the catchment and has around 20 unique species of fish to the river. Since much of the water in the karst (limestone) region is found underground, the cave systems and this habitat provide the highest rate of new species discoveries from any habitat in Europe. One of the unique cave species is the blind Cave Salamander featured in a 2012 David Attenborough film of 10 species to be included in an imaginary conservation Ark. The salamander is the third most genetically distinct amphibian in the world with its closest relative found now in the Yucatan Peninsula of Mexico having separated 200 million years ago when Pangea supercontinent was separating.

Week 1 Itinerary

The groups will be met in Split on the Thursday when their flight arrives, and will be taken directly to the research base in Krka by bus. The journey takes an hour and a half to two hours. When they arrive, they will be given some time to settle in to the camp, before attending a series of safety and welcome presentations. The objectives from these presentations are:

- To explain the overall objectives of the Krka surveys
- To explain the risks associated with working in this area, including:
 - Safe trekking procedures
 - Appropriate footwear and other clothing
 - Avoiding heatstroke
 - Working near and in the rivers

There are 5 core survey projects running at Krka. The groups will be split into 5 teams and will rotate around each of these projects. Before each of the groups departs for the field to take part in one of the surveys they will be given a comprehensive briefing by the survey leader to explain the objectives, the methods, and any relevant safety information. There will also be daily lectures delivered as part of a Mediterranean ecology course which will take place during either the middle of the day when it is harder to work outside in the heat or in the evening.

Day	Group 1	Group 2	Group 3	Group 4	Group 5
Thursday	Arrive Krka late-afternoon. Welcome and Health & Safety presentation. Lecture 1: Introduction to Krka and Mediterranean ecology				
Friday am	Bird mist net surveys	Herpetofauna surveys	Cave surveys	Mammal surveys	Fish surveys
Lecture 2: Freshwater fish speciation and survey techniques					
Friday pm	Bird ID workshop Raptor Surveys	Herpetofauna surveys	Laboratory work Data entry	Mammal surveys	Laboratory work

Friday eve	Evening presentation (optional)	Set traps for small mammals	Evening presentation (optional) Sign up activities			
Saturday am	Cave surveys	Check mammal traps	Electrofishing surveys	Bird mist net surveys	Herpetofauna surveys	
	Lecture 3: Herpetofauna communities and niche overlap					
Saturday pm	Laboratory work Data entry	Mammal surveys	Laboratory work	Bird ID workshop Raptor Surveys	Herpetofauna surveys	
Saturday eve	Evening presentation (optional) Sign up activities					
Sunday am	Electrofishing surveys	Bird mist nets & point counts	Herpetofauna surveys	Cave fauna surveys	Check small mammal traps	
	Lecture 4: Mediterranean mammal communities					
Sunday pm	Laboratory work	Bird ID workshop Raptor Surveys	Herpetofauna surveys	Laboratory work Data entry	Mammal surveys	
Sunday eve	Evening presentation: Finding a career in conservation					
Monday am	Herpetofauna surveys	Cave fauna surveys	Mammal surveys	Electrofishing surveys	Bird mist nets & point counts	
	Lecture 5: Cave biodiversity					
Monday pm	Herpetofauna surveys	Laboratory work Data entry	Mammal surveys	Laboratory work	Bird ID workshop Raptor Surveys	
Monday eve	Set traps for mammals & attend lecture	Lecture 6: Bird communities of the Mediterranean				
Tuesday am	Check small mammal traps	Electrofishing surveys	Bird mist nets & point counts	Herpetofauna surveys	Cave fauna surveys	
	Lecture 7: Threats to Mediterranean wildlife and conservation initiatives					
Tuesday pm	Mammal surveys	Laboratory work	Bird ID workshop Raptor Surveys	Herpetofauna surveys	Laboratory work Data entry	
Tuesday eve	Roundup from the week and social evening					
Wed am	Depart for Mljet island					

Biodiversity Monitoring

Fish surveys

These will be done by boat and foot-based electrofishing surveys. Various habitats along the Krka River will be sampled. The team will be split into two – one half of the team will be based at the bank of the river collecting water samples and taking measurements of abiotic variables such as water temperature and salinity. The other team will be on the boat (just a few metres away) in the river, with the electro fishers, collecting the fish and sending them back to the bank for processing. There are many endemic species including two endemic trout species (*Salmo visovacensis* and *Salmo obtusirostris krkensis*) that are being investigated. All fish captured will be identified, measured and genetic samples taken.

Herpetofauna surveys

These surveys are performed by checking under previously placed cover boards and completing standard search times in different habitats and heights in the valley. Capture – mark – recapture techniques will also be employed. The Park authorities are keen to determine how the Four Lined Snake (*Elaphe quatuorlineata*) which grows to 2.5m, the venomous Nose Horned Viper (*Vipera ammodytes*) and the Leopard Rat Snake (*Zamenis situla*) separate their niches. In addition, the surveys will be recording the distribution of the giant Glass Lizard (*Pseudopus apodus*), which grows to a length of 1.2m and tortoises (*Testudo hermanni*). Night surveys are also done for the Cat Snake (*Telescopus fallax*) which is the only nocturnally active snake species in the region.

Cave surveys

These surveys will be led by cave biology specialists in caves not open to the public and will involve completing transects and quadrats within the cave systems to estimate diversity of groups adapted to cave living. In addition, soil, sand, and guan samples from different parts of the cave system will be taken and analysed to find out what is living there (bacteria, fungi, insects, etc.).

Bird surveys

Bird surveys – these surveys will involve setting mist nets from 6am to 12 noon at different heights in the valley. In addition, point count surveys will be completed either side of the mist net from 7am to 9am each day. Target species for the birds include the Natura 2000 important bird species. In the afternoons raptor surveys will be carried out from designated sample points.

Mammal surveys

The large mammal species are surveyed using camera traps and searching areas for footprints and faecal samples. Within the Krka valley and surrounding plateau there are 2 large wolf packs and these appear to be reducing the jackal and fox populations. In addition to emptying the camera traps and analysing the footage these teams will also be setting and emptying small mammal traps and looking for the endemic vole (*Dinaromys bogdanovi*) found in the Dinaric mountains.

3. Learning and research objectives

The Krka National Park authorities have established a research base station in the centre of the valley that they want to develop into a central biodiversity research hub for the eastern Adriatic region. Two new museums have been built on the site to illustrate the unique ecology of the valley and the historical context since there are numerous Roman sites in the Park and surrounding plateaus. The Opwall role in this plan is to develop the most detailed biodiversity annual monitoring programme of key taxa yet undertaken in Croatia and from this programme to examine community structure and changes over time. The research objectives are:

- To quantify the effect on jackal, fox and other mammal fauna of the recent return and increase in wolf populations in the region
- To determine how the effect of height in the valley affects the bird and reptile communities
- To help quantify the biodiversity of the unique cave fauna

- To quantify the fish communities and habitat associations in the Krka River

Mediterranean Wildlife Ecology Course

Lecture 1: Introduction to Krka, and to Mediterranean Ecology

Lecture 2: Freshwater Fish speciation and survey techniques

Lecture 3: Herpetofauna communities and niche overlap

Lecture 4: Mediterranean mammal communities, apex predators and food webs

Lecture 5: Cave Biodiversity

Lecture 6: Bird communities of the Mediterranean

Lecture 7: Threats to Mediterranean fauna and conservation initiatives

Learning outcomes from week 1

The students should achieve the following learning outcomes from the fieldwork, practicals, lectures and discussions/activities:

- Be able to define karst landscape
- Be able to describe the biogeography of the Dinaric mountains
- Be able to explain speciation processes that have occurred in the region
- Be able to identify the 5 most common freshwater fish species
- Be able to identify and describe the ecology of the herpetofauna of the region
- Be able to identify 5 common bird species from their call and/or by sight
- Be able to describe food webs and predator-prey interactions in the mammal communities of the region
- Be able to identify the most common small and large mammals
- Be able to discuss human-wildlife conflicts in the Dinaric mountains
- Identify the major threats and conservation efforts in the region

4. Week 2: Mljet National Park

For the second week, the groups will be based on Mljet Island. The Mljet National Park is the oldest marine national park in the Mediterranean and was designated in 1960 to protect the largest *Cladocora caespitosa* reef within the Mediterranean. It has two marine lakes that represent the unique karst phenomena of the region. Furthermore, the underwater world in Mljet saltwater lakes holds one of the largest densities of the highly endangered Pinna nobilis shell in the Mediterranean. Mljet Island is one of the most beautiful of the Croatian Islands with large stands of Holm Oak and Aleppo Pine forest and is also home to the famous cave of Odysseus's where he supposedly was shipwrecked; due to the beauty of the island's nature and his love for the nymph Calypso, Odysseus stayed on the island for 7 years.

Week 2 itinerary

On Wednesday morning, the group will leave Krka site to catch a ferry at 07.30hrs from Split to Pomena (Mljet island). Arrival in Pomena will be around 11.00hrs, students will be met and their luggage will be

taken by a van, while the students, accompanied by on-site staff will walk for around 30 minutes to the research base. Students here will either:

- complete a PADI Open Water SCUBA course, with some additional lectures and practicals focusing on Adriatic Ecology or
- complete the full Adriatic Ecology course with SCUBA and/or snorkel practicals to illustrate the lectures, and will also participate in some of the biodiversity surveys

Day	Open Water group	Open Water referral group	Full Adriatic Ecology course group
Wednesday pm	Arrive and settle in		
Wednesday eve	Documentation/check dive/swim test		
Thursday am	Dive theory	Skills check	Buoyancy dive
Thursday pm	Confined water	Open Water 1	Snorkel and free dive training
Thursday eve	Dive theory	Lecture	
Friday am	Confined water	Open Water 2	Seagrass survey training
Friday pm	Free-diving theory and practice	Open Water 3	Seagrass survey
Friday eve	Dive theory	Lecture	
Saturday am	Confined water	Open Water 4 & exam	Fish survey training
Saturday pm	Open Water 1	Snorkel and free dive training	Fish survey
Saturday eve	Dive theory	Lecture	
Sunday am	Open water 2	Seagrass survey training	Sea urchin survey training
Sunday pm	Open water 3	Seagrass survey	Sea urchin survey
Sunday eve	Dive theory exam	Lecture	
Monday am	Open water 4 & Dive certification	Fish survey training	<i>Pinna nobilis</i> training
Monday pm	Research dive	Fish survey	<i>Pinna nobilis</i> survey
Monday eve	Science presentation	Lecture	
Tuesday am	Research dive	<i>Pinna nobilis</i> survey	Seagrass survey
Tuesday pm	Visit to NP lakes	Visit to NP lakes	Visit to NP lakes
Tuesday eve	Packing - Social evening		
Wednesday am	Depart Mljet island		

The practicals will include trips to various bays around the island to conduct underwater visual census (UVC) surveys on the marine fish, sea urchins, sea grass meadows and endangered shell *Pinna nobilis*. Before each of the groups departs for the field to take part in one of the surveys they will be given a comprehensive briefing by the survey leader to explain the objectives, the methods, and any relevant safety information.

The expedition finishes at 09.00hrs on the Wednesday at the end of the second week. The group will then take a boat to Dubrovnik where the bus will wait and take them to Dubrovnik airport.

Biodiversity Monitoring

Fish surveys

Fish surveys are done by visual census at surface by snorkelling and at 10m depth using Scuba recording the species, number, size and habitat. They are done with three 25m transect and 5m width each side at each depth per location. For fish which tend to be present in large numbers such as *Chromis chromis*, the observer will categorise the number or individuals as 0-50, 50-100 and 100+. This monitoring is done at locations where the No Take Zone will be implemented to record changes from year to year. Furthermore, from this year, surveys will also be done using stereo video system.

Sea-urchin surveys

Line transects of 10m length and 2m width are completed at the range 3-8m depth. The researcher records the presence and types of echinoderms found in the transect with a special emphasis on sea urchins. Data recorded include whether the urchins are adult or juvenile, are they sheltered in a hole or crease and which direction they are facing.

This research is done in parallel with the visual fish census in the same locations to determine whether there is a connection between the population of sea urchins and fish. Since it is known that certain fish eat sea urchins the hypothesis is that, in areas with a higher population of certain fish there will be less sea urchins and they are smaller and hidden in holes and folds.

Sea-grass surveys

The south Adriatic has some of the most extensive seagrass beds in the Mediterranean and because of the exceptional water clarity these seagrass meadows extend in some areas down to a depth of 40m. These meadows are important nursery areas for many juvenile fish and crucial for security of the fishery. The aims of this project are:

- To map and monitor the distribution of sea grass beds around Mljet Island
- To assess the health of *Posidonia oceanica*
- To quantify the percentage coverage of invasive algae around Mljet Island

This team will be working around the peninsula where the research base is situated, and will be doing detailed surveys of the seagrass beds up to 15m depth using the same protocol used in all MPAs in Croatia. At each site a buoy will be set down, and from this buoy a circle marked out with a 10m radius. Quadrats will be placed randomly on the seabed within the circle and the following data will be collected by groups of students:

Group 1

- Taking a photo of each quadrat so the edge of the quadrat is just in the frame of the photo
- Describe seagrass species composition
- Measure the depth of each quadrat

Group 2

- Count seagrass rhizomes within the quadrats
- Estimate percentage of seagrass and algal cover and species composition

- Estimate percentage of dead matter

Group 3

- Describe sediment composition into mud, fine sand, sand, coarse sand and gravel
- Identify any macroinvertebrates within the quadrat

Giant Mollusc surveys

Pinna nobilis (or the noble pen shell) is a large species of Mediterranean clam that can reach up to 120cm in shell length. It is a highly protected species and the research is done over a period of a few years to monitor the *Pinna nobilis* population in protected areas.

This survey is conducted by divers/biologists using SCUBA equipment, underwater camera and hand tools (a measuring meter and a diving slate with a pencil). A diver will measure individual molluscs in a specific location and the data is recorded on the diving slate. At the selected location, a circle is marked with a radius of 10m and each specimen in that circle is measured on the depth ranges from 3-5m. For each specimen, the team will record: total length from the place at which the mollusc is embedded in the sand to the top, the width of the widest part of the shell and the width of the narrowest part at the point of embedment in the sand.

Boat monitoring survey

This survey is done from the land 3 times a day and the aim is to collect the data on boat anchoring in the bay in front of the base to see the pressure on sea grass as this is also one of our research sites for sea grass survey. Data collection includes boat length, type of boat, time of a day and wind direction.

5. Learning and research objectives

The Mljet National Park has established a research centre at the north-western tip of the island where the groups will be accommodated, sharing rooms of 3 - 4 bunk beds and communal bathroom facilities. There are showers (3 inside, 1 outside) and 5 toilets on site and the site is fully equipped for diving including a research sailing boat. There are charging facilities with European plug sockets and limited Wifi. Food is prepared by Croatian cooks. The Mljet site and research projects are being coordinated by Deep Blue Explorers and Marine Explorers Society ‘20000 Leagues’ – Croatian NGOs within the Croatian Institute of Biodiversity. Opwall is helping to build up the research outputs with initial concentration on:

- Monitoring changes in fish communities within the proposed No Take Zones and immediately adjacent to them.
- Determining the distribution of the sea urchins and habitat interaction around the island
- Quantifying and marking one of the biggest populations of *Pinna nobilis* sites
- Monitoring seagrass *Posidonia oceanica* meadows and interaction with invasive algae

The course consists of lectures and in water practicals and teaches identification of common genera and species of algae and other macroinvertebrates, identification of the major fish families and common species. It is designed to introduce a variety of methods and practices used for scientific research in the marine environment.

Adriatic Ecology course

The Adriatic Ecology course covers the following topics which are designed to train students in the ecology, conservation issues and survey techniques that are being used on the surveys. The lectures, films and practical exercises on this course will help the students become immersed in the ecology and conservation issues of the Mediterranean and will cover the following areas:

Lecture 1: Introduction to Mljet, Adriatic Marine Ecology and research objectives

Lecture 2: Marine Survey techniques

Lecture 3: Flora and fauna biodiversity

Lecture 4: Invasive species in the Mediterranean

Lecture 5: Problem of plastics pollution in the sea

Lecture 6: Fisheries and MPAs in the Mediterranean and Croatia

Lecture 7: Sustainability of resources

Learning outcomes from week 2

The students should achieve the following learning outcomes from the fieldwork and activities at the Mljet site:

- To understand the importance and changes of flora and fauna in different marine ecosystems
- To understand the threats to the Mediterranean Sea and coast
- Be able to identify at least 5 marine invertebrates and 10 fish species
- Be able to conduct snorkel and SCUBA based surveys of marine flora and fauna
- To have an understanding of small scale fisheries and the importance of MPAs and no take zones
- To have a raised awareness of plastic pollution and ideas of how to reduce it
- To understand the importance of seagrass and its connection to fish biodiversity and climate

6. PADI Open Water training

Full course

This course consists of theory lectures and tests which are completed with instruction from a fully trained Dive Instructor at the research centre. This is accompanied by a series of skills that need to be learned and these are completed in shallow water in front of the base. Once the theory and skills training has been completed the students will then complete 4 Open water dives to qualify the students to a maximum of 18m. They will then be signed off as qualified Open Water divers and can register with PADI (Professional Association of Dive Instructors). Students will need to bring their PADI Open Water manuals with a PIC (Personal Identification Card) that is then used to register with PADI once the training course has been completed. These can be purchased from the Operation Wallacea website prior to expedition <https://divematerials.com/>

Referral course

For those students who have completed both the dive theory and confined water sessions prior to expedition they can complete their PADI Open Water Referral Course on site. The students will first complete a check dive with their instructor to demonstrate that they still remember and can confidently perform the necessary skills to progress on to complete their open water dives.

Once referral students have successfully completed the final stages of their PADI Open Water course, they will be able to progress on to the Adriatic marine ecology course. Referral students will be able to join at a stage where they can get the chance to learn about the application of survey techniques in the marine environment and how that supports the management of natural resources.

7. Links to biology, geography and environmental science syllabuses

The following tables suggest how specifications for Biology, Geography and Environmental Studies might link with your expedition experience through lectures, practicals or in discussion topics: keywords are used for the matching. Topics which have been greyed-out are unlikely to be relevant at this expedition location.

Table 1: Biology

Topic	Biology	AQA		C	CCEA		C.Int		Ed/Sal		OCR		SQA		WJEC		AP	IB
		S	2		S	2	S	2	S	2	S	2	H	A H	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		♦	♦		♦					♦	♦	♦	♦		♦	♦	♦
Agriculture, Human activities, Conservation and Sustainability	Written reports; Research project; Report; Case studies			♦					♦			♦	♦		♦	♦	♦	♦
	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	♦	♦	♦		♦		♦			♦	♦	♦			♦		♦
Behaviour	National Parks; Wildlife reserves						♦											♦
	Environment; Environmental monitoring; Environmental impact; SSSI																	

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)

Table 2: Geography and Environmental Science

Topic	Geography, APES and ESS	IB ESS	APE S	AQA		CCEA		Edex		OCR		WJEC	
				S	2	S	2	S	2	S	2	S	2
	Levels: S=AS 2=A2												
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	◆	◆		◆	◆		◆		◆	◆	◆	
Agriculture, Human activities, Conservation and Sustainability	Written reports; Research project; Report; Case studies	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	
	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	◆			◆					◆			
Behaviour	National Parks; Wildlife reserves								◆				
	Environment; Environmental monitoring; Environmental impact; SSSI												

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)

Academic Benefits and background reading

Apart from the most obvious values of going on an expedition such as contributing towards conservation, the physical challenge and adventurous travel, the experience can also benefit a student by increasing their chances of gaining entry to university or being successful in a job application and impressing at interview. This can be achieved in many different ways but it will often depend upon which country and educational system a learner is from. Common to most countries the experience will:

- Enhance their understanding of course syllabuses
- Allow learners to gain specific qualifications such as:
- Research Qualifications e.g. Extended Essays for IB and UK EPQs
- University Course Credits
- Creativity, Action and Service (CAS) for IB
- Universities Award from ASDAN

IRPs or Individual Research Projects

In the last few years an increasing number of students joining our research programmes are taking this opportunity to undertake IRPs. These research projects take many different forms, but what they all have in common is the need to pose and answer a research question. Examples of these include Extended Project Qualification (EPQ), Extended Essay (EE) for IB, as well as many different projects specific to many educational systems worldwide.

We are able to support the dissertation essay style research question; however individual scientific investigations (in which students design and collect their own data) are more difficult to facilitate given the short amount of time students are present on-site and the logistical constraints within which our expeditions operate.

It is a great opportunity for a student to witness first-hand many of the aspects of their research question and, in many cases, they will have access to samples of past datasets for their project. Students may also have the opportunity to talk with the actual scientists involved which will give them a convincing ‘slant’ to the way in which they answer their research question.

Much of the research they will be able to get involved with is specific to their expedition location. The projects that students will come into contact with range from students helping to collect ecological and biodiversity data through to working and learning alongside the scientists where primary data collection by school students is less practical or more difficult.

For success with IRPs, careful planning is needed by the student and a lot of the work will be done prior to their expedition. They will need close guidance from their school supervisor and the scientists in the field need to be briefed so that support can be provided where they can. We have now developed an application system to ensure that the student will be able to realistically undertake such a project, that their choice of topic is appropriate to their expedition site, the science staff ‘on-site’ are aware of the project and where practical can assist in a constructive way before, during and after their expedition.

More information:

Use this [link](#) or email schoolresearchprojects@opwall.com

Suggested background reading list:

Bradt Travel Guide: Croatia

Piers Letcher and Rudolf Abraham – (2016) ISBN: 13: 9781784770082
(nhbs.com)

DK Eyewitness Travel Guide: Croatia (2015) ISBN-10: 1465426140
(Amazon)

Eastern Europe: An Introduction to the People, Lands, and Culture. ABC-CLIO. ISBN 978-1-57607-800-6.
Retrieved 18 October 2011. Richard C. Frucht (2005).

Red List of Plant Taxons, Animal Taxons (Mammals) of the Republic of Croatia
E.Draganovic – State Institute for Nature Conservation (1994) ISBN:9539606829
(nhbs.com)

Bradt Wildlife Guide: Central and Eastern European Wildlife: A Visitor's Guide
Gerard Gorman – (2008) ISBN-13: 9781841622316
(nhbs.com)

The Status and Distribution of European Mammals – IUCN
Helen Temple – (2007) ISBN-13: 9789279048159
(nhbs.com)

RSPB Birds of Britain and Europe
Rob Hume (2014) RSPB Birds of Britain and Europe
(nhbs.com)

Adriatic East Coast: Seeing Birds and Experiencing Nature in Historic Landscapes on the Mediterranean Coast – EuroNatur Travel Guide.
Martin Schneider-Jacoby – (2012) ISBN-13: 9783000359521
(nhbs.com)

Field Guide to the Amphibians & Reptiles of Britain and Europe
Jeroen Speybroeck – (2016) ISBN-13: 9781408154595
(nhbs.com)

British & European Wild Flowers: Identification Guide
Pamela Forey (2007) ISBN-13: 9781844518401
(nhbs.com)

Flowers of Greece and the Balkans: A Field Guide
Oleg Polunin (1987) ISBN-10: 0192819984
(2nd hand from Amazon)

The Northern Adriatic Ecosystem: Deep Time in a Shallow Sea
Frank McKinney (2007) ISBN-13: 9780231132428
(nhbs.com)

Marine Wildlife of the Mediterranean
Enric Ballesteros (2015) ISBN-13: 9788415885276
(nhbs.com)