

## *Darwin Initiative Annual Report, April 2007*



Replicating biodiversity conservation management at all key soda lakes in the Rift Valley.

Earthwatch Institute (Europe) & University of Leicester

Project Ref Number	EIDPO12
Project Title	Replicating biodiversity conservation management at all key soda lakes in the Rift Valley.
Country(ies)	Kenya, Tanzania
UK Contract Holder Institution	Earthwatch Europe
UK Partner Institution(s)	University of Leicester
Host country Partner Institution(s)	TANAPA (Tanzanian National Parks) , KWS (Kenya Wildlife Service) , NAWASCO (Nakuru Water & Sewage Services), NMK (National Museums of Kenya), University of Nairobi, ACC (African Conservation Centre) and Birdlife International offices in Kenya and Tanzania
Darwin Grant Value	£107,119
Start/End dates of Project	September 2006 – March 2008
Reporting period	1 Apr 2006 to 31 Mar 2007, annual report 1
Project Leader Name	<i>Dr David Harper, Department of Biology, University of Leicester; Sarah Staunton-Lamb, Earthwatch Institute (Europe)</i>
Project website	<a href="http://www.kenya-rift-lakes.org">www.kenya-rift-lakes.org</a>
Author(s), date	<i>Dr David Harper, Department of Biology, University of Leicester, Sarah Staunton-Lamb, Earthwatch Institute (Europe)</i>

## 1. Project Background

The project is located at soda lakes in the Rift Valley, Kenya and Tanzania. This is an extension southwards from the main project which was at Lake Bogoria, the northerly one of a series of 3 lakes in Kenya; themselves part of a larger series in the Eastern Rift that runs through Ethiopia, Kenya and Tanzania (Fig 1). These three Kenyan lakes (Lakes Bogoria, Nakuru and Elmenteita) are the main central feeding lakes of the lesser flamingo *Phoeniconaias minor*. Nakuru was Kenya's first Ramsar site: Bogoria was declared in 2000 and Elmenteita in 2005.

*P. minor* relies on this unique environment. They are nomadic birds, whose main population of not more than 2 million, is confined to about a dozen lakes in the Rift between Tanzania and Ethiopia with a single breeding site, Lake Natron. Three other populations exist in the Old World, each much more limited in size and distribution: in southern Africa, western Africa and western Asia, associated with a few, shallow salt pans.

The species is considered 'near-threatened' by IUCN because the main breeding site, Lake Natron, is unprotected (and is currently threatened with commercial soda extraction proposals). Very little however, was known about the species' feeding requirements and the extent to which different lakes are able to meet them, or for how long. Studies had been carried out in the 1970s at Lake Nakuru, but none since then.

Several mortality events of *P. minor* have occurred irregularly at individual lakes, most recently have been at Lake Bogoria 1999-2000 (circa 200,000 birds; Harper et al., 2003); Lake Nakuru 2004, 30,000 birds; Manyara Tanzania 2004, 15,000 birds and Nakuru, Elmenteita & Oloidien Kenya, 2006, 40-50,000 birds.

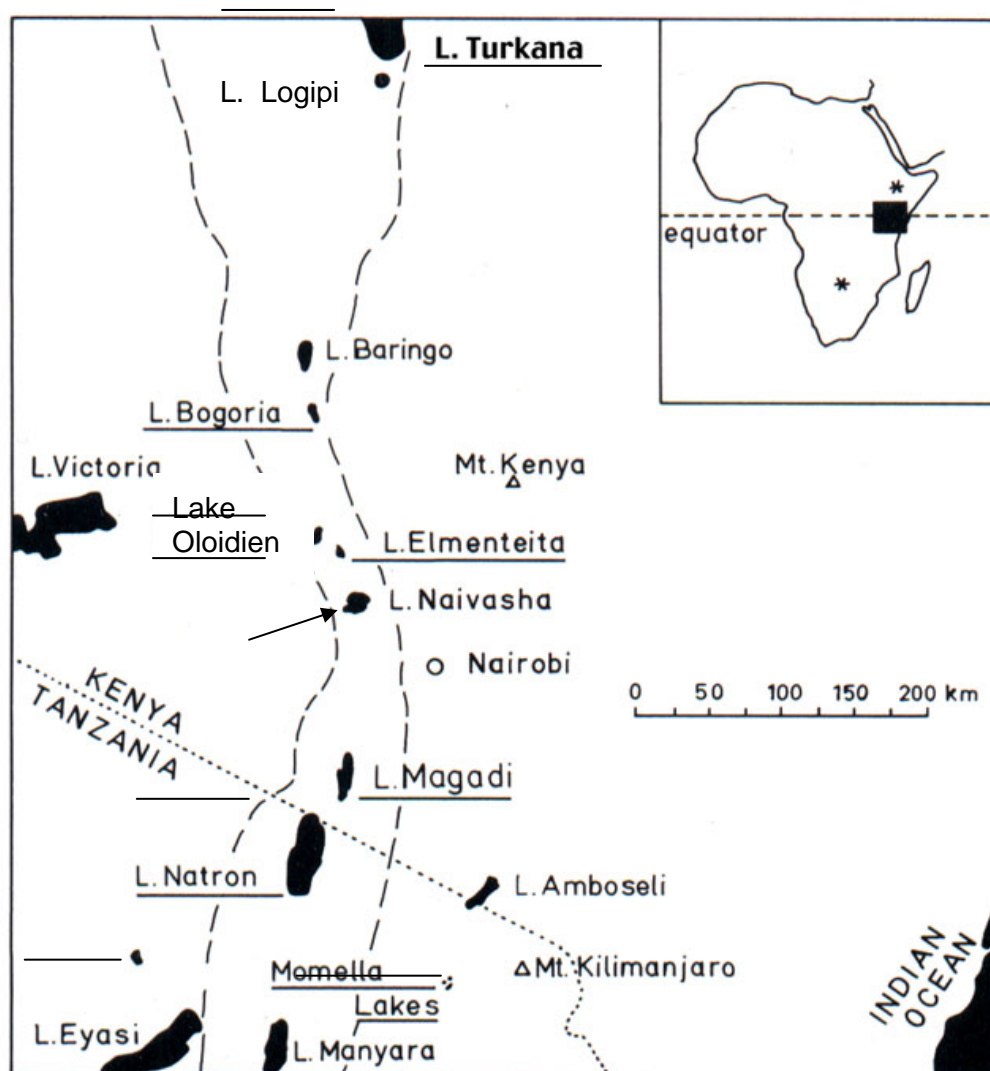


Figure 1. Lakes of the Kenyan Eastern Rift Valley. Saline lakes are underlined. Modified from Harper et al, 2003, to include Oloidien which, by August 2006, was saline enough to attract 180,000 lesser flamingos.

## 2 Project Partnerships

The main partnerships have been with the two National Park authorities. The Tanzanian, TANAPA together with their research organisation TAWIRI, were consulted at project planning and they sent participants to the Workshop (see below). They will come into play in 2008, when we run a team at Lake Manyara. The Kenyan Wildlife Services played a major part in the start-up Workshop in November 2006, together with the presence of key staff at the research/training workshop in March 2007. In the meantime this project will assist the Lake Manyara National Park ecologist through the field work for his M.Sc. at Dar es Salaam University, which is a study of the lake's limnology. Our work has developed at Lake Nakuru National Park, Kenya where a staff ecologist who joined the Earthwatch Lake Bogoria research/training team in November 2006, Samuel Mungai, is being supported during 2007 through his Diploma in Wildlife Management at the KWS Training Institute. In the main project we had developed a working relationship with the new water company at Nakuru (NAWASSCO) and this is now being strengthened by part-support of the senior technician onto a Masters degree in Analytical Chemistry at Egerton University.

We have worked with the African Conservation Centre in the planning for the November field research/training camp in the South Rift at Shompole, which will enable access to both lakes Natron and Magadi. We paid a scoping visit to Shompole and the lakes with them, just after the research/training team for Oloidien/Elmenteita (details below) had finished in March. Still photographs taken on that visit of Natron have formed part of a rapidly-produced film about the life of lesser flamingos made by the Brock Initiative for the ACC, who are leading the Lake Natron Consultative Group which is spearheading opposition to the plans, announced in early 2007, to develop a soda-extraction plant for Lake Natron. This is a development that seriously threatens the breeding of the East African population of *P. minor* (<http://news.bbc.co.uk/1/hi/world/africa/6292434.stm>).

We have worked with the two country partners of Birdlife International to try to establish joint flamingo lake censuses in Kenya (National Museums of Kenya Ornithology Department who partner with Nature Kenya) and Tanzania (Wildlife Conservation Society of Tanzania and TANAPA) but had some problems adhering to our original timetable because of a combination of weather (rain making roads impassable in January) and bureaucracy (staff changes, division of responsibilities). We therefore supported the Kenyan Water Bird Count in January and July, to ensure coverage of the Rift Valley flamingo lakes and are now working with the consortium of international groups led by Neil Baker, Tanzania Bird Atlas, and with Wildlife Conservation Society, to ensure that there are (for the first time ever) concurrent land counts, water sampling and aerial photography of the flamingo lakes in Kenya & Tanzania, in January 2005.

Our partnership with Wildlife Clubs of Kenya, and with local community organisations at Bogoria, has continued (see final report of main project). During the Earthwatch research/training team at Bogoria in November 2006, we produced a third flamingo story for schools, which traces the story of 'Kim' moving from Bogoria down the Rift (different lake characteristics) eventually to Natron, returning to his friends with a wife and chick. This is presently being distributed around these other lakes. It was illustrated by pictures designed and painted by a school pupil from Maji Moto High School, Bogoria, whose final two years' fees we paid for as reward for the illustrations. Our evaluation of the effectiveness of these teaching aids is being carried out at present.

These latter activities are focussed upon Articles 9, 12 and 13 of the CBD. The former relate to Article 7, where our goal is to bring forward national and trans-national capability in the monitoring of *P. minor* populations. The very real threat to Lake Natron (which also impinges on Article 6) evidences the weakness of these two countries in protecting biodiversity. Almost nothing is known about the hydrology or ecology of Lake Natron; highly important evidence which might be used to protect it against damaging developments which ignorance with the lure of economic gain could allow to proceed. It is of note that this Project's research/training workshop for Kenya's Southern Rift, planned before anything was known about the soda ash plant proposal, will have the twin aims of lake limnology and river Ecohydrology (see below).

### **3 Project progress**

#### ***3.1 Progress in carrying out project activities***

Start-up meetings for the project extension were held in August 2006 in Arusha, with TANAPA officials, as well as the TAWIRI Director and several staff members and the Birdlife when DMH was conducting his Scoping Study for Local Action and Global Impact. The meetings were made possible through the partnership with University of Nairobi, which greatly facilitated access to senior people. Combining the two purposes of the visit to Arusha enabled economies over transport and hotels. The formal project start-up workshop was held in the NMK at the end of November 2006, in conjunction with the closing one of the main 3-year project. A full report of that workshop will be shortly available; it was awaiting all contributors Powerpoints or Word files.

This Workshop followed the Earthwatch research/training camp at Lake Bogoria, which was attended by 3 Kenyans and 3 Tanzanians as Project Fellows, alongside six international Earthwatch Volunteers. This was a highly successful combination of people, because both groups valued the insight into other cultures that was achieved by having such a mixed team. The team Fellows attended the Workshop in Nairobi, together with senior officials from TANAPA and KWS.

The Workshop details were reported in the full project Final Report. It was then followed by a training programme in flamingo census techniques for 6 Tanzanians, conducted along the 3 main Kenya soda lakes, taught by NMK and Project staff, in early December.

Project staff then participated in the Kenyan water bird census in January 2007, organised by the NMK, and ensured that the flamingo and associated water birds were censused on all lakes, including the 'new' soda lake, Oloidien, which in 2006 attracted flamingos for the first time because it has been separated from the freshwater Naivasha since 1982 and progressively become more concentrated (Harper et al., 2006). There was no water bird census in Tanzania in January and attempts to set up a flamingo censuses in this lake were frustrated by heavy rains, which made transport impossible.

The Training research team was held in March 2007 as planned, focussed upon Elmenteita, with 12 Kenyan and Tanzanian fellows appointed through Earthwatch partners. It was based at Naivasha, to enable both Elmenteita and Oloidien to be studied as part of the programme. This was followed by a Soda Lake Survey at which all the Kenyan lakes were counted for flamingos and sampled for spirulina. At present plans are being made to participate in the July water bird census to ensure flamingo lake coverage, but plans have not progressed in Tanzania.

The location for the second research training team, to be held at Lakes Natron & Magadi in November, was reconnoitred in early May. That team will have added value in that 1) it will be at the site of a future permanent research camp of ACC and we also will train up Maasai community members as staff for this camp and 2) it will have a parallel scientific theme to that of soda lake ecology, in that the Ewaso Njoro river, which is the main water feeding Lake Natron, flowing into northern end at the Kenya-Tanzania border, flows through a large swamp immediately before the lake. This swamp is vital both for wildlife and as a dry-season fodder for the Maasai. We will carry out preliminary studies there and teach the fundamentals of Ecohydrology to the trainees.

#### ***3.2 Progress towards Project Outputs***

The education Output will be met by the support of in-country education by staff of three partners at Nakuru and Manyara, rather than by Distance Learning as specified. The dissemination of films and books to schools in new clusters has started.

The Output of close collaboration with community CBOs was successfully initiated, as planned, in the November Earthwatch team at Bogoria. The March research/training team did not work as planned at Elmenteita, due to various logistical reasons. One of these was main road rebuilding, which made access to local communities at the southern shore of that lake difficult. Instead, similar work was carried out in three informal settlements alongside Lake Naivasha, as well as being part of the South Rift scoping visit to Shompole.

The timescale of the two scientific publications of the main project, on flamingo health and ecological stability, has slipped due to delays in obtaining laboratory results. Nevertheless the work is proceeding towards both.

The difficulties of achieving simultaneous soda lake surveys in the two countries and the proposed way of working round these difficulties to produce a major outcome in January 2008, is outlined above.

Press releases were well picked-up. In October, *The Independent*, carried a centre-spread picture of lesser flamingos at Oloidien. In December, many media outlets picked up the story about lesser flamingo at Bogoria dying of starvation due to lack of spirulina food and being too weak to fly elsewhere.

### 3.3 *Standard Output Measures*

**Table 1 Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	TOTAL
Established codes				
2	Masters' Education	Two staff identified	Two staff will complete	2
3	Other education	Two staff identified	Two will complete	2
4	Training	Five training weeks provided, in 2 camps 3 p-grads, 9 grads, 6 others	Two more teams, 24 personnel	42 expected
7	Materials	1 new story book	Another planned	2
8	UK staff-weeks training	17.5 weeks	Circa 15	32.5
11	Peer-reviewed publications		5	5
14	Community workshops	2 Bogoria, 2 Naivasha	4	8
15	Press releases	2 UK	Ad hoc	2+

**Table 2 Publications**

**No Publications have yet been completed**

### **3.4 Progress towards the project purpose and outcomes**

The outputs will still be achieved, but the main scientific ones in a different way. It has not been possible to achieve simultaneous soda lake surveys in the two countries so the surveys continue in Kenya whilst negotiation is leading to a major simultaneous count, both on land and air, in January 2008. This has never been done before.

### **3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits**

We are successfully building up the appreciation of the importance, yet fragility, of flamingo habitat, through involvement of the communities around them in 'their own' lake and 'their own' birds. The work we started at Bogoria is being continued through the Earthwatch-sponsored research teams; this DI project is moving this involvement southward to Nakuru and Elmenteita, then the south Rift, then into Tanzania. We have started to make a quantitative estimation of the effects of our work, by evaluating the impact of films and of books upon school children's understanding of biodiversity conservation issues; this will be reported in the final project report.

## **4 Monitoring, evaluation and lessons**

The Earthwatch Institute is monitoring the immediate responses of Fellows on research/training teams and a longer-term follow up of their careers will be contained in the final report. As two examples, one Kenyan Fellow from the March team has successfully registered for an M.Sc. in Hydrobiology at Nairobi University in October 07 and will work as a volunteer on the soda lake studies so that she is able to take one aspect forward to her dissertation. One Tanzanian Fellow from March (Sokoine University graduate) is now working on the quantitative evaluation of school aids.

## **5 Actions taken in response to previous reviews (if applicable)**

This is not applicable.

## **6 Other comments on progress not covered elsewhere**

The small changes that have been made as a result of circumstances have been mentioned above.

## **7 Sustainability**

We are trying to link the work into sustainable livelihoods of lake communities. This is most successful in Bogoria, because we have the benefit of additional research/training teams through the Earthwatch funding model. Work at Elmenteita is temporarily not achieved due to the road building, but contacts have been made for later work. The overall project which this DI project fits within, "Lakes, People & Wetlands of the East African Rift Valley" has a major impact upon the communities around the lakes

## **8 Dissemination**

The main dissemination was the Workshop at the end of main, start of this project. This will be turned into printed output and distributed shortly. One of the decisions taken at the Workshop was the agreed need for a website accessible to all soda lake managers and scientists, which could build up a database of chemistry, biology and anecdotal reports. This website would need to be accessible to all to add to it as well as controllable by all. Negotiations are continuing to establish this within the Freshwater Biological Association's site [www.freshwaterlife.org](http://www.freshwaterlife.org). The advantage of this is that it will continue indefinitely after this DI project, as part of the connections which the FBA is keen to re-make with African lakes (it was formerly the "FBA of the British Empire" and in those days it mounted several expeditions to Africa. It is now re-establishing itself as a worldwide service for information exchange about freshwater (and inland soda water!) life).

The FBA is bringing out a new journal of reviews of freshwater science, 'Freshwater Reviews' and the Editor has agreed to accept a review written by project team members which will bring all knowledge of soda lakes and lesser flamingos (most of which is in poorly-accessible grey literature) into the public domain. This will be done by the end of the calendar year 2007.

As a consequence of the heightened understanding of lesser flamingos which our DI project has helped to generate, UNEP has started a 2-year project, focussed upon Nakuru, funded by China. We are in communication with the organiser of this, Anderson Koyo, who was the former KWS Deputy Director (Wetlands).

## 9 Project Expenditure

Please expand and complete Table 3.

**Table 3 Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)**

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget.

Variance

Printing – the publication of support material around the project and educational resources has been delayed until more information around results and community consultation has taken place. Only one team has fielded within this annual report and it was felt more appropriate to wait until more data was gathered.

Capital items – more was spent on setting up camp than originally anticipated. However since camp equipment has now been purchased savings will be made in subsequent teams.

## 10 OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

[I agree for ECTF and the Darwin Secretariat to publish the content of this section](#)

This section will be completed for final report.

## Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/07

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	Actions required/planned for next period
<p><b>Goal:</b> <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>		<p><i>We have started to work closely with CBOs at Bogoria to link biodiversity of the Reserve to the improvements of their livelihoods</i></p>	<p><i>Completion of the work at Bogoria, replication of these at Elementeita, Shompole and Manyara</i></p>
<p><b>Purpose</b> To offer practical training in soda lake conservation &amp; management at 3 new soda lakes. To provide scientific information and host country capacity for soda lake management and conservation down the Rift Valley. To assist communities achieve sustainable use of natural resources.</p>	<p>Knowledge and understanding of techniques for soda lake conservation &amp; management expanded at 3 new locations</p> <p>Data and information gathered from expanded monitoring programme fed into existing or developing lake management plans and country biodiversity strategies</p> <p>Enhanced community understanding of soda lake research</p> <p>Enhanced community livelihoods linked to lakes</p>	<p>Knowledge achieved, community understanding enhanced, in the Naivasha region near to the lakes Elmenteita and Oloidien, continued to be developed at Bogoria</p>	<p>Similar in South Rift and Manyara</p>
<p>Output 1.</p> <p>Host countries' capacity for soda lake conservation and management enhanced</p> <p>Quarterly lake monitoring programme expanded across Rift</p>	<p>36 key staff members from lake management authorities, conservation organisations and local communities trained</p> <p>Monitoring programme ongoing at 8 soda lakes in Kenya and Tanzania</p>	<p>All will be achieved by EoP. Monitoring at lakes in Tz will not be as frequent as planned, Elementeita community links are delayed.</p>	



<p>Valley region and into a new country</p> <p>Local communities feel enhanced 'ownership' of soda lakes</p> <p>3 more clusters of schools develop better conservation education</p> <p>Improved scientific understanding of the variation in soda lake ecology in the Rift Valley</p>	<p>3 workshops of 2 days each, held at Lake Elementeita, Shompole and Lake Manyara.</p> <p>12 schools each receive 6 workbooks, 6 posters, 24 story books and 4 education films</p> <p>Eco-tourist booklets produced for 3 localities</p> <p>6 weeks of scientific research at 3 new soda lake locations</p>	
<p>Activity 1.</p> <p>Research/Training teams</p> <p>Soda lake monitoring programme</p> <p>Community workshops &amp; public education</p>	<p>All activities have been and are being executed subject to the small changes outlined above.</p>	

## Annex 2 Project's full current logframe

Project summary	Measurable indicators	Means of verification	Important assumptions
<p><b>Goal:</b></p> <p><i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</i></p> <ul style="list-style-type: none"> <li><i>* the conservation of biological diversity,</i></li> <li><i>* the sustainable use of its components, and</i></li> <li><i>* the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></li> </ul>			
<p><b>Purpose</b></p> <p>To offer practical training in soda lake conservation &amp; management at 3 new soda lakes.</p> <p>To provide scientific information and host country capacity for soda lake management and conservation down the Rift Valley.</p> <p>To assist communities achieve sustainable use of natural resources.</p>	<p>Knowledge and understanding of techniques for soda lake conservation &amp; management expanded at 3 new locations</p> <p>Data and information gathered from expanded monitoring programme fed into existing or developing lake management plans and country biodiversity strategies</p> <p>Enhanced community understanding of soda lake research</p> <p>Enhanced community livelihoods linked to lakes</p>	<p>Annual reports and recommendations</p> <p>3 Research/training teams</p> <p>3 host country staff complete Ecology D-L</p> <p>1 Ramsar management plan (Lake Elementeita)</p> <p>3 recommendations to existing management plans at Lakes Natron, Magadi &amp; Manyara</p> <p>6 days of community workshops</p> <p>Community enterprises</p>	<p>Current national political and economic conditions do not deteriorate to the extent that it is unsafe to work to Kenya or Tanzania</p> <p>Project partners remain supportive of the Post-project objectives and purpose</p>

<p><b>2. Outputs</b></p> <ul style="list-style-type: none"> <li>• Host countries' capacity for soda lake conservation and management enhanced</li> <li>• Quarterly lake monitoring programme expanded across Rift Valley region and into a new country</li> <li>• Local communities feel enhanced 'ownership' of soda lakes</li> <li>• 3 more clusters of schools develop better conservation education</li> <li>• Improved scientific understanding of the variation in soda lake ecology in the Rift Valley</li> </ul>	<ul style="list-style-type: none"> <li>• 36 key staff members from lake management authorities, conservation organisations and local communities trained</li> <li>• Monitoring programme ongoing at 8 soda lakes in Kenya and Tanzania</li> <li>• 3 workshops of 2 days each, held at Lake Elementeita, Shompole and Lake Manyara.</li> <li>• 12 schools each receive 6 workbooks, 6 posters, 24 story books and 4 education films</li> <li>• Eco-tourist booklets produced for 3 localities</li> <li>• 6 weeks of scientific research at 3 new soda lake locations</li> </ul>	<ul style="list-style-type: none"> <li>• Training curriculum</li> <li>• Network of participants in training/research teams</li> <li>• List of trained professional and community lake monitors</li> <li>• 2 new equipped lake monitoring laboratories</li> <li>• Workshop reports</li> <li>• Education packs</li> <li>• Education Films</li> <li>• Scientific booklets about soda lake ecology</li> <li>• At least 5 peer-reviewed journal articles published</li> <li>• At least 4 popular articles</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of training opportunities in soda lake conservation in Kenya and Tanzania continues to be considered a priority to be addressed</li> <li>• Staffing levels of lake management authorities remain to carry out monitoring programme</li> <li>• Community interest in soda lakes remains</li> </ul>
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### ***Checklist for submission***

	Check
<b>Is the report less than 5MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> putting the project number in the Subject line.	YES
Have you completed the Project Expenditure table?	YES
Supporting Documents: Evaluation Report of Team 1 Report completed by participant on Team 1: Margaret Nduku Kyalo.	YES