

FINAL REPORT



Sinai Baton Blue Butterfly Conservation Project

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Introduction

The report structure:

Why this report:

This report is submitted in fulfillment of the terms and conditions of the Rufford Small Grants Foundation of \$9,102 made to the **Sinai Baton Blue Butterfly Conservation Project –Egypt** in 2009. This report represents the project results and outputs after completion the project's activities. It is concern with activities that funded by of the Rufford Small Grants Foundation and implemented according to the presented proposal.

For whom this report:

This report is prepared and submitted mainly to the RSG's team. This report contains information may be useful for many other parties, which it focuses specifically on status of endangered and Endemic Sinai Baton Blue Butterfly *Pseudophilotes sinaicus* in Egypt. The report addresses specifically the survey results for *Pseudophilotes sinaicus*, also describes the related activities which carried parallel to the survey under the project's activities such as public awareness and training.

Report scope:

The report data and results relates only to Saint Katherine Area at latitude 28°32' and longitude 33°58'. It is give detailed results and the first conservation status for the endangered and Endemic Sinai Baton Blue Butterfly *Pseudophilotes sinaicus* in Egypt within the period from February 2009- February 2010.

The project background

The target species

The Sinai Baton Blue Butterfly, *Pseudophilotes sinaicus* Nakamura 1975, is endemic to a tiny area of the high mountains of South Sinai, its known distribution entirely contained within the great Ring Dyke surrounding the town of St Katherine (James et al. 2003). In fact, all known patches of its host-plant, the near-endemic Sinai Thyme (*Thymus decussatus* Benth.: Lamiaceae), and hence all known populations of the butterfly, lie within a radius of 3 km centered on St Katherine. After the initial description of *Pseudophilotes sinaicus* by Ichiro Nakamura (1975), very few additional observations were reported until 2001, when Mike James discovered 25 local populations, each one occupying a discrete patch of thyme (James et al., 2003).

The Sinai Baton Blue's persistence is due to metapopulation dynamics and this has important implications for its conservation.

The butterfly's metapopulation was predicted to persist for at least 200 years.

Many factors threatening the butterfly's survival

1. Livestock grazing in thyme patches.
2. Over collection of thyme plants for medicinal purposes.

3. Anthropogenic climate change.
4. Small fragile population size.
5. Fragmented habitat.

Sinai Baton Blue Butterfly Conservation Project is the first project implemented to conserve the smallest butterfly in the world funded by Rufford Small Grants Foundation. The aim of the project is to conserve this butterfly in its habitats. This project started since February 2009. The project activities are varies to achieve the main aim of the project.



Map 1. Global distribution for the Sinai Baton Blue butterfly



Figure 1. Sinai Baton Blue butterfly, *Pseudophilotes sinicus*



Figure 2. Sinai Baton Blue butterfly, *Pseudophilotes sinaicus*



Figure 3. Sinai Thyme *Thymus decussatus* larval host-plant

The Project site

The project's activities run within Saint Katherine Protectorate, South Sinai, Egypt. The Sinai Peninsula extends over 61,000km²: it forms a land bridge between Africa and Asia and its flora and fauna have been influenced by both continental masses. Four phytogeographic regions meet and overlap in Sinai; of these the Saharo-Arabian (desert vegetation) and the Irano-Turanian (steppe vegetation) largely characterise the central mountain block, which covers most of the Sinai south of latitude 29° N. and contains the St Katherine Protectorate. This South Sinai massif is an isolated mountainous block composed largely of crystalline rocks and is geologically related to the Precambrian African plate and the Arabian Shield. The Gulfs of Aqaba and Suez form effective ecological barriers. The crystalline massif is very rough country characterised by the highest mountains in Egypt, a dense wadi system and an arid climate. The central higher mountains constituting the Protectorate form island of Central Asian steppe vegetation along with Irano-Turanian biota. Sinai's endemic

species are largely restricted to this “island” together with relict populations of Palaearctic and Oriental species.

- The Saint Katherine Protectorate extends over 4,350km² of South Sinai, making it the largest protectorate in Sinai, Egypt.
- The Protectorate includes the world renowned Monastery of Saint Katherine and Mt. Sinai, where Moses is said to have received the Ten Commandments; these places were listed as a cultural World Heritage Site in 2002.
- The protected area contains a unique landscape of high scenic quality, with diverse associated habitats, flora and fauna along with unique or traditional land-use patterns and social organisations as evidenced in historical human settlements, local customs, livelihoods, and religious beliefs.
- As much of the area is inaccessible to motor vehicles the major part of the Protectorate remains in a largely natural state.
- The St Katherine Protectorate is an area of great biological interest; it has been recognized by IUCN, as one of the most important regions for flora diversity in the Middle East. It contains about 44% of Egypt's endemic flora and a very high proportion of Egypt's endemic fauna, including butterflies.
- The Protectorate is included in the BirdLife International, Directory of Important Bird Areas in Egypt.
- The Protectorate forms one element of a system of five protected areas, which collectively represent the diversity of marine coastal and terrestrial ecosystems and their contained biodiversity, of South Sinai.
- A 641km² core area of the Protectorate has been listed as a World Heritage Status on “Cultural Criteria” and it will be further listed as an Associative Cultural Landscape under “Natural Criteria.”



Map 2. Project located in St. Katherine City, South Sinai, Egypt

Climate

The St Katherine Protectorate lies in the arid North African desert belt; it is characterised by a Saharo-Mediterranean climate. Although the altitude moderates the temperature regime, summers are relatively hot, with a mean maximum temperature of 36° C (August), while winters are relatively cool with mean minimum temperatures

of -7.8°C (February) in St Katherine Town and minimum temperatures of minus 20°C, with wind chill. Precipitation is less than 50mm/year, compared to 13mm at El Tur on the western coastal plain some 50km away; orographic effects can increase precipitation to 300mm/year at higher elevations, supplemented by occasional winter snow. Rainfall is sporadic but usually falls between October and May, when major flash floods can occur after torrential rain. The relative humidity is low, normally between 10 and 20% and rarely exceeds 50%, so potential evaporation rates are very high – in excess of 20mm/day in August.

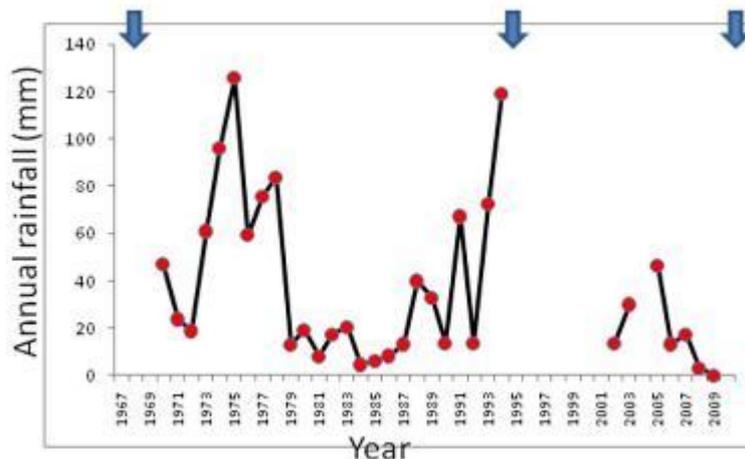


Figure 4: Total annual rainfall data for the years 1970. The arrows indicate years of floods

Project aims

The aim of the project is to:-

1. Monitor the status of the Sinai Baton Blue butterfly.
2. Implement solutions to mitigate the threats.
3. Improve the awareness related to Sinai Baton Blue butterfly.

Project activities:-

1. Run an annual survey for the butterfly during the activity season using MRR. The only survey (2002) counted 500 butterflies in Farsh Shoeib. With the grant, MRR studies can also be extended to many other patches. Climatic data will be collected by the portable weather station.
2. Designing and implement a paved path around the Farsh Shoeib habitat to encourage visitors not to trample the site, using environmentally friendly materials; there are significant logistic issues in transporting materials up to the site (which is at 2000 m altitude).
3. Reactivation the traditional *hif* agreement used by local Bedouin to prevent overharvesting in wadis; applied to Farsh Shoeib, this will control grazing during the active season. Agreement will entail giving these people alternative feed for their livestock.

4. Establishing a fenced enclosure around the main gully of Farsh Shoeib where hostplants and butterflies are densest.
5. Public awareness campaigns directed toward local communities and tourists to embed the ideas of conservation and ecotourism, by making presentations and workshops, and distributing printed material.

Sinai Baton Blue butterfly Survey and monitoring

Sinai Baton Blue butterfly life cycle:-

The female butterfly lays about 20-30 eggs in spring, a day after mating, on the young buds of its host-plant, Sinai Thyme. After an incubation period of a few days, the eggs hatch into small larvae which feed on the buds and flowers of Sinai Thyme. These larvae make an appeasement relationship with one type of ant (*Lepisiota obtusa*). The larva has two organs that it uses in its relationship with ants; the Dorsal Nectary Organ (which secretes droplets of simple sugars and amino acids for this ant species) and the Tentacular Organ (which produces volatile secretions that attract and alert attendant ants if a caterpillar are alarmed). However, larvae are also heavily preyed upon by another species of ant, *Crematogaster aegyptiaca*. This ant is very influential to the local distribution of the butterfly because in areas where it is found, no butterflies survive.

Larval development takes ca. 21 days. On reaching full size, larvae descend to the bottom of the thyme plant and pupate. The pupae spend the whole autumn and winter in their cocoons, and when the temperature rises in late spring (during April to June), the adults emerge and males begin searching for females.

The whole lifecycle of this butterfly depends upon the Sinai Thyme. This plant is also rare and localized to this small area of the world. It grows in patches of various sizes only on the mountains around the town of St Katherine.

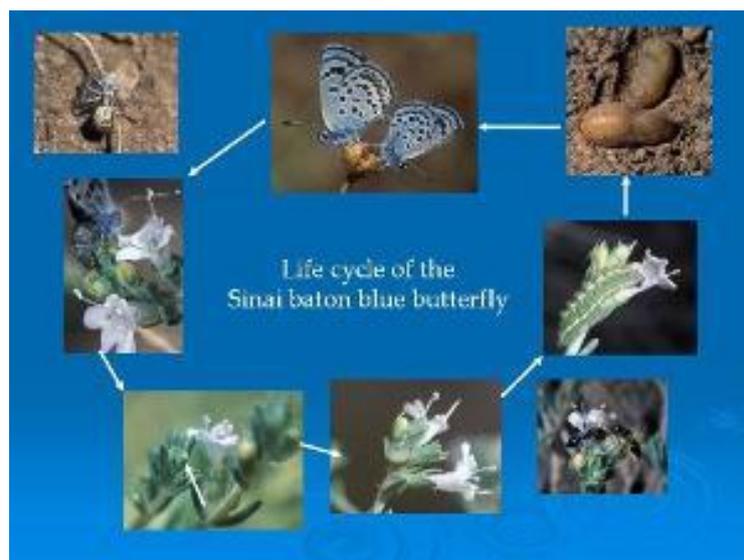


Figure 5. Sinai Baton Blue butterfly life cycle

Survey methodology

The vegetation status of the Sinai Thymus within Farsh Shoeib had been determined by botanists, and the climatic data collected by Weather station.

Mark Release Recapture (MRR) technique, individuals from a population are captured and marked, and then resampled. Data on the number of recaptured individuals relative to new individuals caught are then used to estimate population size.

The survey runs during the activity season of the adult butterfly from end of April to end of July. During this season the butterfly habitat had been visited regularly to estimate the butterfly population size using MRR technique.

Also during the survey the sex for encountered butterfly is considered.



Figure 6. Sinai Baton Blue butterfly Sexual Dimorphism

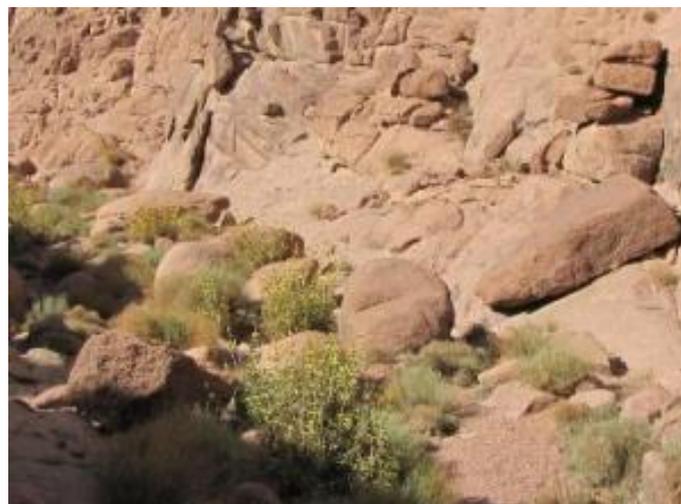


Figure 7. Sinai Baton Blue butterfly habitat



Figure 8. Sinai Baton Blue butterfly survey using sweep net



Figure 9. Marked butterfly

Designing and implement a paved path around the Farsh Shoeib habitat

The aim of this activity is to encourage the visitors to use this designed path and to reduce the trample effect on butterfly habitat, and give chance for the butterfly stages to recover.

After receiving the fund the project start immediately in designing and implementing the paved path, because it will facilitate the other project activities (the labor animals with use this path while transporting fencing materials& visitor with use it during visiting the butterfly habitat).

The project team decided to use the native people that they live near to the butterfly habitat, this for two reason;

The first one, to share the local community in conservation.

The second one, to improve the income for this people

Local communities have to feel that the benefits of conservation back to them. And this is the way to guarantee the sustainability of the conservation activities. The project use the environmental friendly materials while implementing this paved path, these materials came from the same habitat to prevent the undesirable effect of the other materials and also prevent the optic pollution of the landscape.



Figure 10. Workers from local community implementing the paved path



Figure 11. Workers from local community implementing the paved path



Figure 12. Workers from local community implementing the paved path



Figure 13. Workers from local community implementing the paved path



Figure 14. Workers from local community implementing the paved path

Reactivation the traditional *hilf* agreement.

The traditional conservation ethic is deep-rooted, with the tribal system of *el hilf* (the agreement) to control seasonal use of pasture or personal action. This system was enforced by tribal law (*'urf*) so when a person pledges to uphold a principle that all tribes people regard as just, acting against it violates both his personal honour and *'urf* itself.

Hilf means swear, in this agreement the tribal leaders swear to prevent the grazing inside the targeted site for specific time to give the plants the chance to recover again. The aim of this activity is to;

1. Reduce the overgrazing pressure on the larval host plant (Sinai thymus).
2. Involve the local community in different levels in conservation activities.

The project team spent long time arrange for the *hilf* agreement because it need to negotiate with local community the criticality of the butterfly habitat and project have to collect all tribal leaders in one meeting to get an *hilf* agreement, in same time the project have to support alternative sources for livestock's food.



Figure 15. Tribal leaders and project staff negotiate *hilf* agreement



Figure 16. Tribal leaders and project staff negotiate *hilf* agreement



Figure 17. Tribal leaders and project staff negotiate *hulf* agreement



Figure 18. *Hulf* agreement statement

Hulf agreement

In this agreement, Sinai Baton Blue Butterfly Conservation Project announces that; the Sinai Baton Blue Butterfly habitat in Farsh Shoieb declared as closed area from July 1, 2009 until September 1, 2009. During this period all people committed to

prevent all activities (Grazing by Goat, Sheep and Camel and plant collection) in the declared area, in order to conserve the Sinai Baton Blue Butterfly. Fines will apply to every one violate this agreement, the fines will determine according to Bedouin traditional law.

This agreement has been done in presence of the following:

• **Local community's representative**

Shikh\ Mohamed Auda	Gebalyia trip boss
Shikh\ Fathi Eid	El-Hamyda family leader
Shikh\ Mostafa Taha	Awlad Sleem family leader
Shikh\ Musa Hassan	Awlad Gendy family leader
Shikh\ Hassan Awad	El-wahybat family leader
Shikh\ Ahmed Farag	Gebalyia trip vice leader
Shikh\ Ramadan Musa	Local community representative from Wadi Al- Arbay'n
Shikh\ Manssor Musa	Local community representative from Wadi Al- Esba'ya

• **Saint Katherine protectorate board (Governmental Organization)**

Mr. Mohamed Hemad	vice manager SKP
Geo. Ayman Tokhy	Senior Ranger SKP
Mr. Ismail Hatab	Ranger SKP
Mr. Mohamed Metwaly	Ranger SKP
Mr. Zaied Hemad	Community guard SKP
Mr. Mahmud Manssor	Community guard SKP
Mr. Musa Ramadan	Community guard SKP

• **Sinai Baton Blue Butterfly Conservation Project (Rufford Small Grant)**

Mr. Alaa Eldeen	Project team leader
Mr. Mohamed Kamel	Project team member

The Sinai Baton Blue Butterfly Conservation Project responsible to follow this agreement and acknowledge the public about this agreement.

Establishing a fenced enclosure around the main gulley of Farsh Shoeib where hostplants and butterflies are densest.

The fence is an extra control around the Sinai butterfly habitat. Since the Sinai Butterfly habitat is a wild area and there is many wild animals in this area. This animals feed on the wild plants which is the Sinai Thymus is one of these plants, which is the Sinai Baton Blue Butterfly larval hostplants. Also Farsh Shoeib where hostplants and butterflies are densest located in the mountain Sinai which receive the large number of tourists in Egypt (more than 1000 tourists / year). For all this reasons there is a need to add extra control on this habitat to avoid any risk and reduce the negative impact may come in future.

Since the project aim is to conserve the smallest butterfly and in same time engage local community to share in conservation activities to grantee the sustainability of the conservation, the project depend on the local community in establishing the fence around the butterfly habitat.



Figure 19. Local community establishing fence around the butterfly habitat



Figure 20. Local community establishing fence around the butterfly habitat



Figure 21. Local community establishing fence around the butterfly habitat



Figure 22. Local community's labor animals used to transfer the fence materials

The project establish a small dam inside the butterfly habitat to keep water from rain fall in the ground to give more chance for the plants in this area to grow healthy



Figure 23. Small dam have been built to collect rain full water



Figure 24. Small dam have been built to collect rain full water



Figure 25. Project panel on the fence



Figure 26. Project panel on the fence

Public awareness campaigns.

Public awareness is a main activity in this project, because all the project activities depend on the participation from local communities, stakeholders and other interests.

Public awareness is the only activity that runs along the project time.

Public awareness is directed toward verities of classes (Local community, Students, Stakeholders, tourists and scientists).

Many materials have been used as tools for public awareness include the following:

1. Printed materials (Brochures, Stickers and panel)
2. Movies
3. Power point presentations

4. Medals

Project team members designed all printed materials to be easy for all Arabic and English language people to understand it. Also other materials used in public awareness came from Bio-map project (Movies and Stories). Also SKP visitor center used as a center for project awareness especially for tourists.

During the project time, many presentations and campaigns done.

- The project has been invited to presentation during the greatest symposium in Egypt, in the Cairo International Conferences Center in Cairo, Egypt. Where about 3000 persons from different Cities in Egypt were gathered to share in conference of Preparing Professional Leader under sponsorship of Nature Conservation Sector (NCS).
- Egyptian Radio and Television union selects a Sinai Baton Blue Butterfly as a model for Egyptian Endemic and Endangered species in Egypt for preparing reportage about it.
- The project organized the Summer Environmental Week Campaign in St Katherine City to raise the awareness for locals and visitors. This campaign run along 7 days and included many activities:
 - Setup a Sinai Baton Blue Butterfly's Friends group, this butterfly's friends group gather 12 guys from different ages start from 8 years till 16 years old.
 - Presentation had been done for the attendees to learn about the value of this butterfly and its importance in our ecosystem.
 - Workshop with attendees for sharing in mitigates the threats facing the butterfly.
 - Field trip to butterfly habitat.
 - Cleaning campaign day: the day's slogan is "**We clean to conserve our butterfly**".
 - Butterfly's friends group were visited the butterfly habitats and share in cleaning this habitats, watching the butterfly in its real habitats and learned how to determine the threats and how to think to mitigate this threats.
- The project was invited to present a presentation on the project activities and the threats facing this butterfly during The Eco Guide Certification Program in South Sinai, Egypt. Where about 60 tour guides from different Cities in South Sinai, Egypt were gathered to attend a training course for How to be an Eco-Guide under supervision Nature and Heritage Conservationists Association (NHCA) and under sponsorship of Leeds metropolitan University.
- The project was invited to presentation on the project activities during the Egyptian Protected Areas Managers' annual meeting in Sharm El Shikh city, South Sinai, Egypt. Where the director of Nature Conservation Sector of Egypt, the Nature Conservation Sector consultants and more than 75 rangers from different parks in Egypt were attended this presentation.
- the first national day for the Sinai Baton Blue Butterfly was arranged, during this day many activities had been run
 - The Sinai Baton Blue Butterfly's Friends group draws a model for this butterfly in the white T shirt to ware it during this day.
 - Marathon for conserve the butterfly.

- Meeting with tourists and local people to raise the awareness about Sinai Baton Blue Butterfly.
- Many journalists attended this event and publish articles in journals about this butterfly.
- Talk show program made reportage about this marathon and Sinai Baton Blue Butterfly.
- About 20 presentations in Arabic and English language done to local communities, students and tourists during the project time.



Figure 27. Butterfly stand during conference of Preparing Professional Leader



Figure 28. Butterfly stand during conference of Preparing Professional Leader



Figure 29. School visits



Figure 30. School visits



Figure 31. School visits



Figure 32. School visits



Figure 33. School visits



Figure 34. University presentations



Figure 35. University presentations



Figure 36. Awareness campaigns



Figure 37. Awareness campaigns



Figure 38. Egyptian TV reportage



Figure 39. Sinai Baton Blue Butterfly's Friends group workshop



Figure 40. Sinai Baton Blue Butterfly's Friends group



Figure 41. Sinai Baton Blue Butterfly's Friends group workshop



Figure 42. Sinai Baton Blue Butterfly's Friends group using the paved track during butterfly habitat visit



Figure 43. Sinai Baton Blue Butterfly's Friends group visit fenced butterfly habitat



Figure 44. Sinai Baton Blue Butterfly's Friends group learning butterfly monitoring technique



Figure 45. Sinai Baton Blue Butterfly's Friends group learning butterfly monitoring technique



Figure 46. Sinai Baton Blue Butterfly's Friends group workshop



Figure 47. Awareness campaign



Figure 48. Awareness campaign for students during earth day celebration



Figure 49. Preparation to butterfly national day



Figure 50. Preparation to butterfly national day



Figure 51. Preparation to butterfly national day



Figure 52. Local Communities share in preparation to butterfly national day



Figure 53. Children share in preparation to butterfly national day



Figure 54. T Shirt Used during butterfly national day



Figure 55. Butterfly national day



Figure 56. Butterfly national day & Marathon



Figure 57. Butterfly national day & Marathon



Figure 58. Butterfly national day & Marathon



Figure 59. Butterfly national day & Marathon



Figure 59. Marathon Participants



Figure 60. Marathon Participants



Figure 61. Marathon Participants



Figure 62. T.V. Interview with participants during Butterfly national day & Marathon



Figure 63. Marathon Participants



Figure 64. Marathon Participants



Figure 65. Marathon Participants group photo.

Activities	Indicators	Current Status
annual survey for the butterfly	Current status of the Sinai Baton Blue Butterfly	Good (done)
paved path	Presence of paved Path	Very good (done)
<i>hifl</i> agreement	Signed agreement statement	Very good (done)
fenced enclosure	Presence of fenced enclosure	Very good (done)
Public awareness	Improve the Butterfly awareness among people	excellent (done)
Total evaluation		Very good (done)