

Dear Earthwatcher!

The field season of the project "Butterflies of Vietnam" in 2008 has been completed. As the Principal Investigator of the project, and on behalf of the project staff, I would like to thank you for all your help and contributions. You were more than just a support to our research project. We could not have carried out our research or gained the results that we did without your help and your contribution of time and money. I am most grateful.

Your involvement has made it possible for us to develop a process for using butterflies as eco-indicators of habitat disturbance and monitoring the changes of butterflies over time in the Tam Dao National Park. Due to difficulty in the world economy, we had only two teams in 2008, but we have done very well. We recorded the greatest number of species for June in 2008. Our recorded data have shown that forest disturbance has led to a serious decline in the abundance of forest butterfly species since 2004. Some populations of open area species increased, as the quality of forest-cut habitats were improved and there were more open gaps within the forest.

Volunteers also helped find food plants, caterpillars and pupa of butterflies. These represent an important field of biology, especially in butterfly conservation and raising butterflies. Your participation assisted us in using butterflies to assess the success of conservation measures and to find better solutions to conserving butterflies in Tam Dao in particular and Vietnam in general. You also helped take pictures of plants, caterpillars and pupa, and butterflies.

You are good, enthusiastic, patient, kind and generous people! We have learned much from you, and I hope that you have also learned some things from the project and from us. We had a wonderful time with you in Tam Dao. It is a beautiful and ideal site. You brought us your experience, nature, passion and joyfulness.

To all Earthwatch Volunteers, I cannot express in writing how delightful it was to work with you. The Earthwatch Institute brought us together from different nations and cultures in the world. We represented different ages and occupations. Our time together provided us with a unique opportunity to begin to understand each other. The Earthwatch Institute has made our Earth a smaller place and helps us to learn how to live peacefully within it. We were all in an international family.

Once again, I would like to thank all of you who contributed time and money to help us carry out the research work in Tam Dao National Park, Vietnam. We miss all of you and hope to see you again one day.

Sincerely,



Vu Van Lien



EARTHWATCH INSTITUTE ANNUAL FIELD REPORT

Project title: Butterflies of Vietnam
Date completed: February 3, 2009
Completed by: Vu Van Lien
Period covered: May – November 2008

Research report

Objective 1: Continue to identify butterflies that can be used as ecological indicators of habitat changes in Vietnam

Two butterfly families, Snake Eye butterflies (Satyridae) and Jungle butterflies (Amathusiidae) can be used as indicators for the forest habitats. There are a few butterfly species which were identified as ecological indicators to assess the impact of the disturbance of natural forests on butterflies in Tam Dao. Forest indicator species are *Ragadia crisilda*, *Neope muirheadi*, *Mandarinia regalis*, *Mycalesis misenus*, *Mycalesis inopia*, *Stichopthalma howqua* and *Thaumantis diores*. In addition, other butterflies can be used as grass indicator species such as *Zizeeria maha*.

Objective 2: Monitor the long-term changes of butterfly abundance temporally at fixed sites (butterfly transects) in the park. Study impact of forest destruction on butterfly abundance and trend of their populations through years.

The preliminary results of monitoring butterflies (started in 2002) indicated that forest disturbance impacted on the abundance of forest butterfly species. In 2005, vegetations along forest transects were cut down to make a new road that caused a severe decline in forest butterfly species in 2005. Populations of forest butterflies were not different in later years in 2006 and 2007. The typical forest butterflies are *Ragadia crisilda*, *Neope murrheadi*, *Mycalesis misenus*, *Lethe syrcis*, *Melanitis leda* and *Stichopthalma howqua*. Populations of some open-habitat butterfly species tend to increase as more forest openings are created (report of 2007).

For the project year of 2008, data were obtained for June and October (two teams in June and October). There was not enough data from May to November to compare with previous years, except data in June and October. Data comparison in June and October between 2008 and previous years is indicated in Figures 1 and 2. Both Figures 1 and 2 show that the 2008 showed the greatest species and individual numbers of butterflies for June; especially individual numbers per count in transects 2 and 3 (Figure 2). It seems that both species and

individual numbers in transects 1, 2, and 3 have been increasing from 2005 to 2008. The other transects – transects 4, 5 and 6 – seem not to be increasing, just oscillating a little or showing little change. In 2008, it seems that forest butterfly species had more individuals than in previous years. This is due to the partial recovery of vegetation. This means that habitat is better than in previous years for those species. If there was not any disturbance, the vegetation would be in good health and more forest butterflies would be seen.

The transect 1 (Tr1), the tall and short grass and shrub, butterfly numbers were almost the same between three years 2002, 2003 and 2004, but declined in 2005 (report in 2007) and increased in later years. Species and individual numbers of butterflies in June and October increased gradually from 2005 to 2008, with the greatest numbers in 2008 (Figure 1 and 2). This increase is because there were more open areas in the forest and the habitat was much better compared to 2005, with more small shrub, flowers and short grasses growing and attracting more butterflies.

The transect 2 (Tr2) and the transect 3 (tr3), represent regenerating forest and natural closed forest. Here, butterfly numbers increased in 2004, reduced in 2005, then increased later years in 2006, 2007 and 2008, especially increasing in individual numbers in 2008. Vegetation along transects were cut down in 2005. However, in 2006, more space with grass, small shrub and flowers along transects were grown that attracted more open-habitat butterfly species. The forest-habitat species reduced in numbers due to the vegetation cut down, but open-habitat butterfly species increased in numbers. The increase in abundance of open-area species exceeds the decrease in abundance of forest-habitat species, resulting in the increase of butterfly numbers of transects 2 and 3 in later years from 2005 (Figure 1 and 2).

The vegetation in transects 4, 5 and 6 has not varied greatly over the years so the species and individual numbers of butterflies are not very different between these years (Figure 1 and 2).

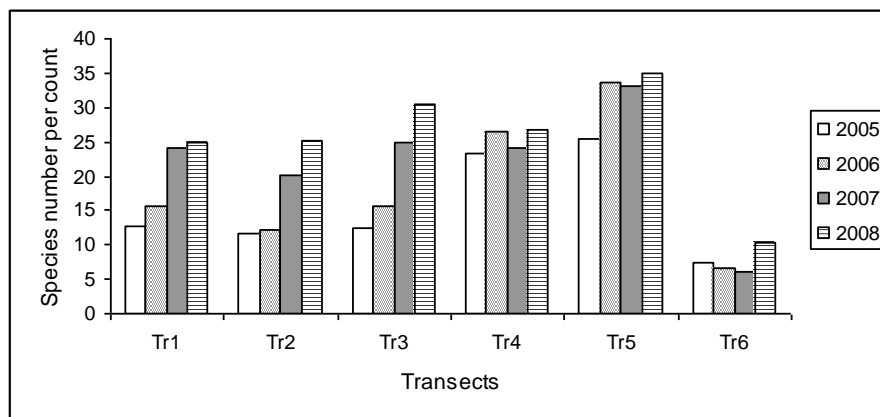


Figure 1. Species numbers per count recorded in June and October from 2005 to 2008

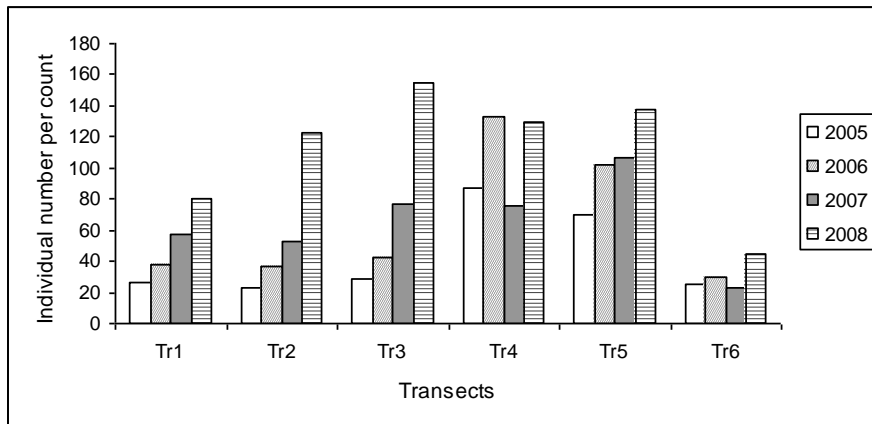


Figure 2. Individual numbers per count recorded in June and October from 2005 to 2008

Taraka hamada (Lycaenidae family) was again recorded in 2008, having been absent for some years. This butterfly was recorded on some forested sections of the road transect (transect 4) and recorded again in the new road transect (transect 2). The vegetations along some sections of the road transect where this butterfly appeared were heavily disturbed in recent years, resulting in the butterfly not having been seen for a few years.

Some butterfly species were recorded for the first time in the transects. They are *Satarupa gopala* and *Pseudocoladenia dan fabia* (Hesperiidae family). However, some butterfly species have still not been seen for some years. They are *Caleta roxus* and *Castalius rosimon* (Lycaenidae family). As with *Taraka hamada*, these butterflies were seen in some forested sections of the road transect (transect 4). Some other butterfly species are absent on the road transect (transect 4), perhaps, due to more construction, forest destruction and invasion of agricultural crops.

Objective 3: Find food plants for butterfly caterpillars, grow food plants and raise butterflies, especially rare and valuable species.

We have identified some important food plants for butterfly caterpillars, as reported in 2007. In 2008, we found more food plants for butterfly caterpillars, including rare butterfly species such as *Atrophaneura crassipes*, which feeds on the plant *Aristolochia balansae* (Aristolochiaceae family). This rare and beautiful butterfly requires conservation. We also found some caterpillars of Swallowtail butterflies *Papilio bianor* and *P. paris* (Papilionidae) feeding on *Zanthoxylum* sp. (Rutaceae family). The information on the life history of these species is valuable for breeding butterflies for conservation and other purposes.

Summary of results

Data, results and emerging trends

A total of 127 different butterfly species and 4327 individuals were recorded along six different transects in a variety of habitats, from open or agricultural land to natural closed forest, in May and October, 2008. The greatest species number for a team was recorded in June (107 species). We recorded the fluctuations in abundance of butterfly species over time. The overall number (abundance) of butterfly communities has been increasing since 2005. Vegetation cutting within the forest in 2004 had led to more open-area species, but the forest destruction severely reduced numbers of forest butterfly species.

Conservation impacts

Although the abundance of butterfly communities has been increasing since 2005, forest butterfly species decreased when vegetation along transects was cut down in 2004. Forest destruction caused a decline in populations of forest-habitat butterfly species and an increase in populations of open-habitat species. In order to conserve butterflies, the natural forest has to be protected. Conservation measures should be focused on protection of the forest butterfly species.

Significance/ benefits of research

Local: Indicating to the local people the value of butterflies and their environment.

Foreign volunteers taking part in research in the local area have raised awareness and interest in local communities about the butterfly study and conservation and other environmental problems in the area. It positively affects local attitudes and concern for the protection of wildlife and the environment. Environmental awareness is quite low in Vietnam in general and Tam Dao in particular where a lot of domestic tourists visit annually.

The research helped undergraduate students and staff of the Tam Dao National Park to familiarise themselves with the purposes, methodologies and plan of the research. Through the project they have learned: to identify and record butterflies (different families and species); to understand the role and relationship between the environment and butterflies; how and where to look for eggs, caterpillars of butterflies and raise them. They also can monitor butterflies and other creatures in the park.

National / Regional: Identifying the life histories of butterflies and raising butterflies, especially rare species, helps raise butterflies for conservation in the area of Tam Dao in particular and Vietnam in general. In addition, undergraduate and graduate students taking part in the project gained knowledge about butterfly ecology, biology and methods of monitoring butterflies for ecology and conservation.

International: Earthwatch volunteers from different nations participated in the project obtained knowledge about butterflies, the value of butterflies as well as the relationship between butterflies and their environment, the important role of butterflies in the nature and how to conserve butterflies. They also know about how to monitor butterflies overtime, look for food plants, caterpillars and raised caterpillars. The project affected them positively that they can help protect the nature and environment better in their home countries.

Communication of results

Printed:

Vu, V. L. (2009). Diversity and similarity of butterfly communities in five different habitat types at Tam Dao National Park, Vietnam. *Journal of Zoology* 277, p. 15-22.

Some other papers will be published in Nation of Vietnam as well as International journals. Proceedings of conference on National Ecology of Vietnam will be soon at the end of 2009.

Digital:

More photographs were displayed in <http://www.pbase.com/vulien>. CD ROMs including photos and data were given to volunteers.

Educational Opportunities

Helping different communities understand and act towards the conservation of a sustainable environment

Some local people are interested in raising butterflies so that they can do business or make specimens for themselves. Sometimes staff of the park and students are taking part in the project, learning how to monitor and collect scientific data in the field. Other scientists visiting the project have developed their understanding about the importance of the work. The Tam Dao National Park has data from the research that are contributing toward limiting over-development in the centre of the park.

Contributed to the completion of Masters' or PhD

The project has contributed to the completion of PhD thesis of the Principal Investigator, which was successfully defended in May 2008. The project also helped undergraduate and graduate students to conduct research for their theses.

Acknowledgements

I would like to very much thank our team leader and staff Mr.Dang Ngoc Anh, Vu Dinh Viet, Mr. Tien the director of Tam Dao National Park for giving us permission to work in the park, and other scientists and students. Thanks especially go to the 21 Earthwatch volunteers from United States of America, England, Australia, Canada, Japan, Malaysia, Russia, Singapore, and Uzbekistan. Great thanks to The Earthwatch Institute who funded the project.