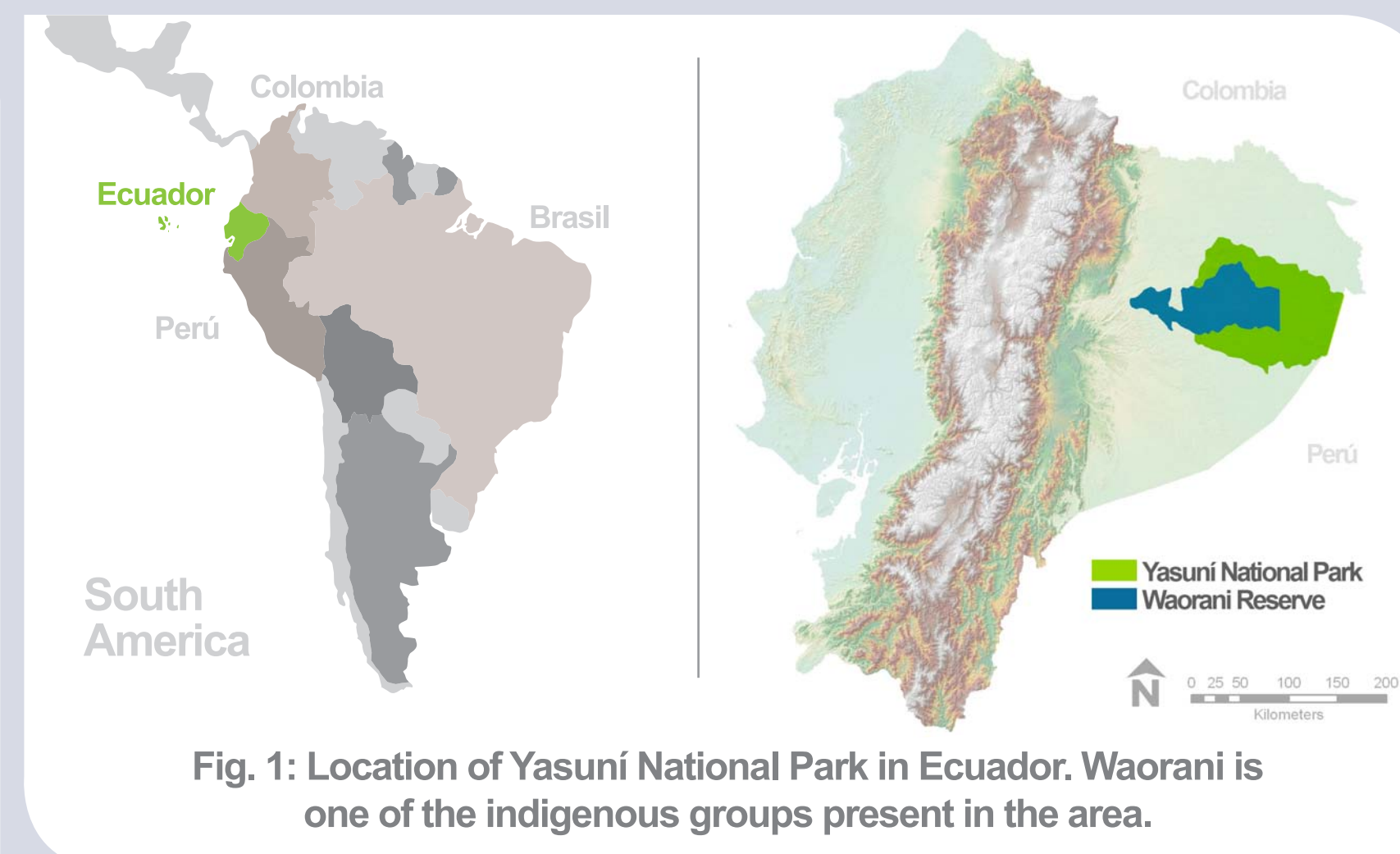
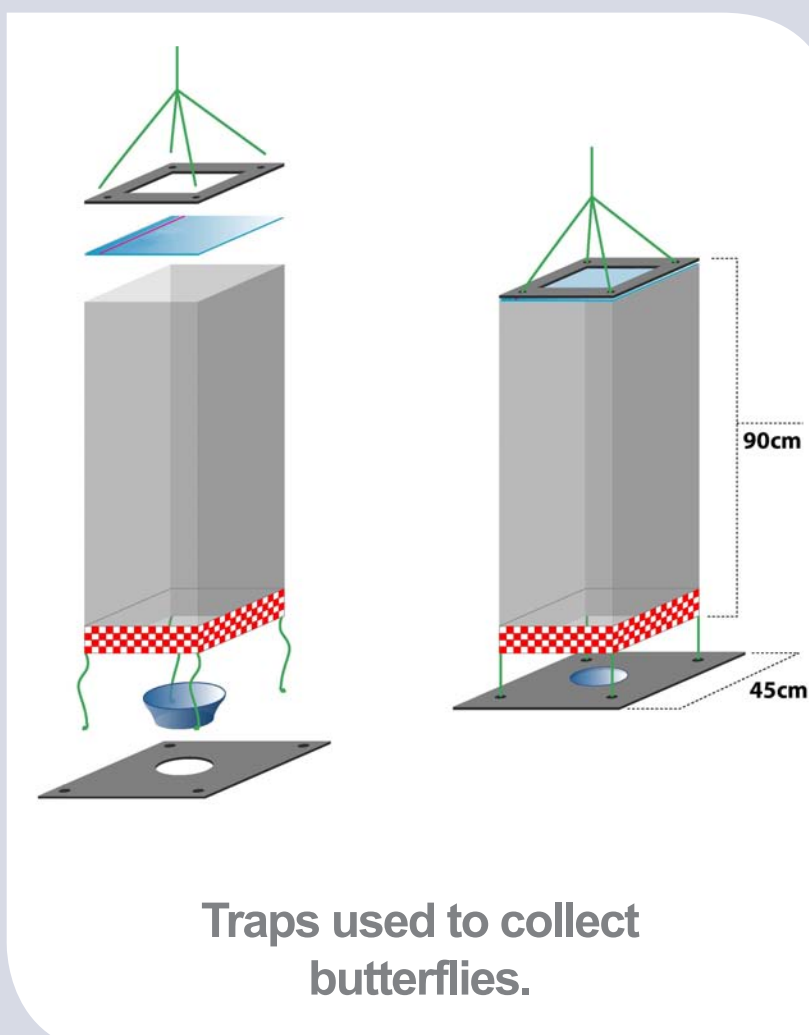


Dynamics of Ecuadorian Amazon butterflies: implications for conserving the world's richest fauna

- Yasuní National Park in Ecuador's Amazonia is one of the world's most biodiverse forests, for plants, vertebrates and invertebrates, including butterflies and is also home for several indigenous groups, some still uncontacted.
- Unfortunately, there is tremendous pressure on natural habitats in the Ecuadorian Amazon due to its oil reserves.
- Promotion of sustainable development in this area, where less than 50% of forests remain and more than 70% of people are poor, is urgently needed.
- Butterflies can provide an alternative source of income through butterfly farming (as it has done in Costa Rica and Tanzania) and important information for conservation programs, but a scarcity of ecological information currently limits their potential.

Methodology

- I studied the community ecology of nymphalid butterflies, a group often used in biocommerce and conservation, during one year in Yasuní National Park (Fig. 1).
- Bait traps were used to measure species abundance in different habitats and strata. Temperature and precipitation were recorded over the year to determine the relationship between these variables and butterfly communities.
- Bibliographical research was done to determine the conservation status of Yasuní forest habitats and current threats.



Results

Biological study

- This study generated information about temporal and spatial patterns of butterflies (where and when they occur) and resulted in new species and new records for Ecuador (Fig. 2).
- Butterfly populations fluctuated over the year, with a peak of butterfly abundance and species richness in September, showing that scientific or commercial research may be best concentrated during this time (Fig. 3).
- Temperature and rainfall are closely related to butterfly abundance, with temperature being the most important, despite varying by only one degree during the year. Amazonian butterflies will therefore likely be strongly affected by projected global climate change.
- Ecological information was applied in a pilot project of butterfly farming in the region, which set up the basic guidelines for future initiatives.

1. *Magneptychia* sp. n.
2. *Eunica anna*
3. *Adelpha amazona*
4. *Eunica violetta*
5. *Narope cyllabarus*
6. *Megeptychia monopunctata*
7. *Heliconius leucadia*
8. *Anaeomorphia splendida*
9. *Neruda metharme*



Fig. 2: New species (1), new records for Ecuador (2-4) and rare species of butterflies (5-9) recorded in Yasuní.

Bibliographical research

- Illegal selective logging has become a significant factor in habitat alteration in the region, but oil exploitation remains the most important.
- Oil exploitation has produced dramatic negative effects to the environment and local people, including deforestation, contamination of water sources and land, in turn producing severe health diseases such as cancer (Fig. 4).
- Exploitation of natural resources has failed to alleviate poverty among most Ecuadorians, especially local Amazonian communities, because oil revenue has mainly served to pay Ecuador's external debt over the past 40 years.
- Results were published both as scientific papers and as posters for environmental education, and a planned book will include a photographic guide of butterflies for future farming or other initiatives (Fig. 5).

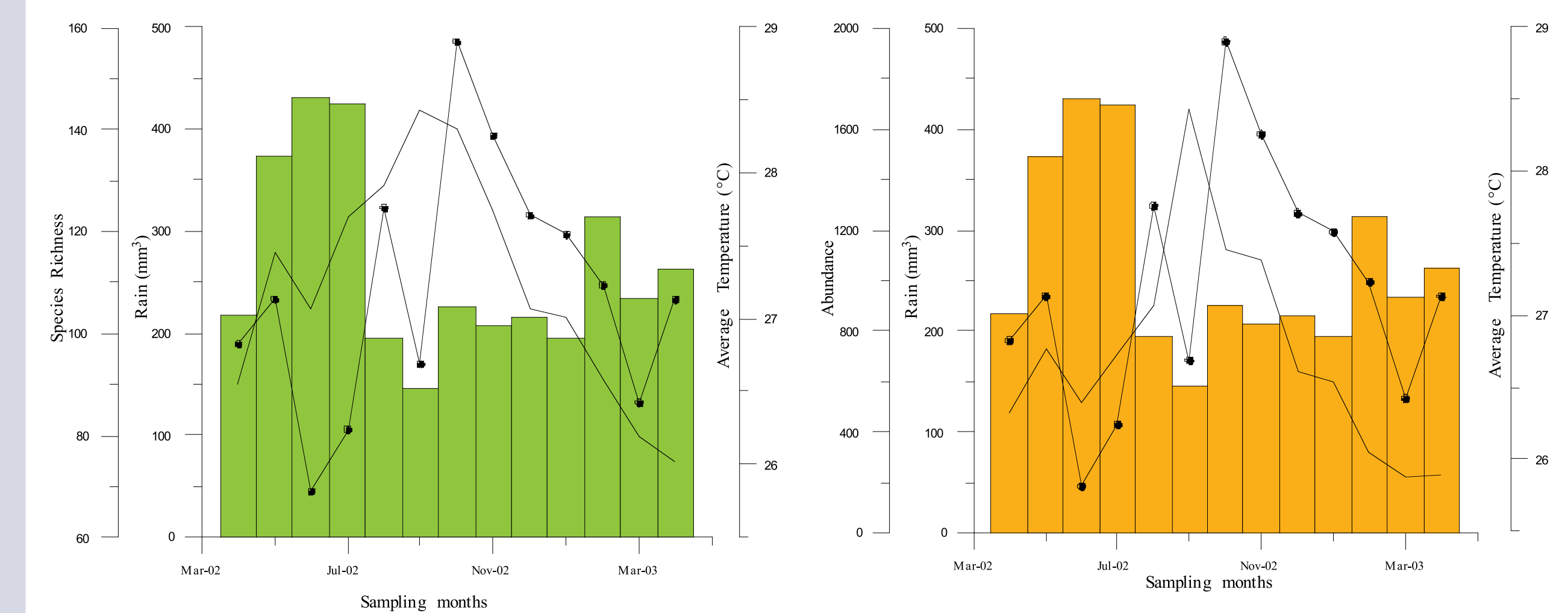


Fig. 3: Fluctuation of butterfly abundance and species richness over time with a peak in September, which is closely related to rain (bars) and mean temperature (line with dots).



Fig. 4: Oil exploitation has produced tremendous negative effects in Yasuní, mainly contamination and health problems, including cancer.

Discussion

- These results will be useful to better determine the IUCN threat status of butterfly species and possible effects of climate change in Neotropical insects, topics important for conservation but still poorly researched.
- Studies about climate change in Yasuní are very useful as this park lies within an area thought to have retained moist forest during past dry climatic periods, and thus perhaps has a particular potential to serve as a refuge for Amazonian species during the coming decades, if it remains preserved.
- This study may contribute to implement a sustainable strategy through butterfly farming (butterfly rearing in green houses for exhibitions) in the Ecuadorian Amazonia and promote conservation.
- These aspects are particularly important for Yasuní National Park as the local government for the first time in national history launched the initiative of not exploiting the second largest untapped oil reserves in Ecuador (located in Yasuní) in exchange for financial compensation from the international community or from carbon markets.
- Publications will emphasize the importance of rainforest and popularize biodiversity of Yasuní, but most importantly will help to increase awareness in society, a still passive actor that can ultimately save this endangered paradise.



Fig. 5: Material produced for environmental education with the slogan "Save our forests".



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