



## How Ecosystems Support Us Agriculture, Insect Pollinators and Habitat Quality in Trinidad's Nariva Swamp

### The importance of insect pollinators

Pollination is vital to human well-being. This ecosystem service is important for sustaining agricultural crop production and wild plant communities as well as for keeping ecosystems healthy. Many plants rely on insects like bees, flies, wasps, beetles, butterflies and moths to fertilise their ovaries with pollen to form fruit. There is a very close relationship between insect pollinators, where they live (their habitat), and the plants and crops they pollinate. But evidence suggests that pollination is in decline worldwide. Habitat destruction, pesticide use, diseases, parasites and unsustainable farming practices are some of the things that threaten communities of pollinators and their territory. Over time, this has the potential to affect crop production and ecosystem health.

### Understanding the connection between agriculture, pollinators, and habitat

In Trinidad and Tobago, the Project for Ecosystem Services (ProEcoServ) is examining the relationship between the ecosystem services provided by agriculture, pollination, and pollinator habitat quality in Trinidad's Nariva Swamp to have a better understanding of how they work together and what is needed to ensure they can continue to support human well-being.

Agriculture makes an important contribution to people's livelihoods in the Plum Mitan area of Nariva and some of the crops that farmers grow there, like cucumbers and watermelons, depend on insect pollinators. Lower levels of pollination could affect food production and the health of ecosystems negatively. And this decline would have a direct impact on food supply. For this reason, it is important to understand the relationship between agriculture, pollination and



Insect pollinators, particularly bees, are in decline around the world.

pollinator habitat quality in the area. If there is a disruption to any one service, the way in which local people benefit will change, or they might lose a benefit they relied on in the past.

### Research focus

The goal of ProEcoServ's research in Nariva is to evaluate how possible changes in the future, for example in land use and climate, could affect agriculture, pollination and pollinator habitat quality ecosystem services and how they interact with one another. Together with the results and findings from ProEcoServ's other pilot sites (eastern Northern Range and south-western Tobago/Buccoo), the Nariva research project is expected to contribute to a more complete picture of the value of Trinidad and Tobago's ecosystem services and to the integration of these values into national planning and accounting.

Research activities in Nariva are focused on:

- Assessing, mapping and valuing agriculture, pollination and pollinator habitat quality;
- Identifying how these services support or work against each other in order to identify win-win-win scenarios;
- Identifying the factors that affect the supply of these services;
- Assessing the relationship between forces of change to ecosystems services and the quantity of services provided;
- Mapping the flow of benefits from these ecosystem services to local and national stakeholders; and
- Using these maps as the basis for participatory decision-making.

### Methodology

The project is investigating the way in which agriculture, pollination and

pollinator habitat quality ecosystem services are supplied, the extent and value of each service and the way in which they interact to produce potential synergies and/or trade-offs.

The three ecosystem services are being assessed individually through pollinator exclusion experiments, pollen analyses, field observations, habitat assessments, questionnaires and focus groups. The Integrated Valuation of Environmental Services and Tradeoffs (InVEST) program is being used for mapping and partial valuations of the services, trade-off analyses, scenario planning and driver relationship assessments. For more information about the InVEST tool, go to <http://www.naturalcapitalproject.org/InVEST.html>

The productivity of plants grown in meshed enclosures (background), pollination bags in open enclosures (foreground) and open plots is compared to assess pollinator contributions. Photo: Lena Dempewolf



## Results

The project will provide farmers and local and national planners with data and management tools for decision-making about land use and farm management. This information will feed into a computer-based information system that is being developed under the ProEcoServ Trinidad and Tobago component to help in planning and development decision-making.

The Nariva project is coordinated by Lena Dempewolf as part of her research for a PhD at the University of the West Indies. Lena began her research in 2011 and expects to complete it in 2014. For more information, contact Lena via email: [lena.dempewolf@gmail.com](mailto:lena.dempewolf@gmail.com)

## The Project for Ecosystem Services (ProEcoServ) 2010 - 2014

The Project for Ecosystem Services (ProEcoServ) is a four-year global initiative that aims to better integrate ecosystem assessment and economic valuation of ecosystem services into poverty reduction and sustainable national development planning.

ProEcoServ is funded by the Global Environment Facility and implemented by the United Nations Environment

Programme in Trinidad and Tobago, Chile, Vietnam, South Africa and Lesotho.

ProEcoServ Trinidad and Tobago is led by the Department of Life Sciences, University of the West Indies, St. Augustine Campus and the Ministry of Planning and Sustainable Development, in collaboration with a consortium of local partners.



THE CROPPER  
FOUNDATION



For more information on ProEcoServ and the Trinidad and Tobago component go to <http://www.proecoserv.org/>

Contact: Professor John Agard, National Coordinator, ProEcoServ.  
Telephone: +868 662-2002 Ext. 83095; Fax: +868 663-5241; Email: [john.agard@sta.uwi.edu](mailto:john.agard@sta.uwi.edu)