

# Monarchs, Mexico and More

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## Contents

Executive Summary	2
Introduction	2
Key Learnings	4
Conclusions	5
Appendix (Interviews/Travel Diary)	<a href="https://tinyurl.com/wcmt-pdf">https://tinyurl.com/wcmt-pdf</a>

## **Executive Summary**

In 2017, with the assistance of the WCMT I travelled to Mexico and the USA to investigate the migration of the monarch butterfly in North America, and environmental factors such as the effects of climate change and conservation measures already in place.

I already knew the numbers of monarchs had decreased by about 90% over the last 20 years (Brower, 21 March 2011). I wanted to bring ideas back to NZ to improve the situation of our butterflies, other invertebrates and the environment.

In total I spent six weeks in North America speaking with over thirty people including scientists, conservationists, lepidopterists, entomologists, teachers, and students about the monarch butterfly.

I returned to New Zealand enthusiastic to continue my work educating gardeners, teachers, children, and anyone who will listen, the importance of respect and care for our butterflies.

## **Introduction**

For many years I have been sharing my knowledge of monarch butterflies – and more recently, of NZ's indigenous butterflies and moths. My presentations to gardening clubs, schools and service clubs and the displays the MBNZT (Moths and Butterflies of NZ Trust) arrange at shows (e.g. NZ Flower and Garden Show) awaken an interest in the environment and biodiversity. For the same period of time I have been communicating with scientists and professionals in North America and stay up to date with the latest research about monarch butterflies and their amazing migration from as far north as Canada to Mexico.

Every year monarch butterflies migrate from the east of the Rocky Mountains to overwinter in oyamel fir trees in the Mariposa Monarca Biosphere Reserve, in the Mexican states of Michoacán and Mexico.

My request of the Winston Churchill Memorial Trust was to visit three key contacts and others to give me a greater understanding of the migration and what conservation measures were being put in place.

My meetings were to include:

- Lincoln Brower, in Virginia, a distinguished scientist who has been studying monarch butterfly biology since the 1950s (Rice, 2017).
- Chip Taylor in Kansas. Chip founded Monarch Watch, an outreach program focusing on education, research and conservation of monarch butterflies (Monarch\_Butterfly\_Fund, 2016).
- Jose Luis Alvarez, a reforester in the State of Mexico, an advisor to Forests for Monarchs (Forests for Monarchs, 1997).

I needed a better understanding of how our butterflies were being affected by climate change and other environmental factors.

Butterflies are considered 'the canaries of the coalmine'. In North America much has been done in studying the monarch migration, and steps are in place to protect this amazing natural phenomenon. I wanted to be able to share ideas with New Zealanders and thus improve the health of our environment here.

When I began making my plans I realised that to do this would require travelling to Mexico in the midwinter (Northern Hemisphere, January) but driving across the USA at that time would not permit me to see conservation practices in action. With the support of the Winston Churchill Memorial Trust I changed my plan to make the journey in two stages: Mexico in January, and mainland USA in April-May.

The timing of my fellowship was fortuitous due to the recent serious decline in numbers of monarch butterflies in North America, the consequences of climate change affecting the world, and similar concerns here in NZ. The trip would also include seeing the overwintering monarch butterflies in Mexico and an opportunity to meet with Mexican people in their own communities, to see how they respect the monarch and for me to learn from their culture, lifestyle, artisan products and crafts.

On both trips I rented a car for my travel. In Mexico, I was accompanied by my 14-year-old grandson, who benefited hugely from the experience, experiencing another culture. This put his own NZ lifestyle into a new perspective.

I was extremely privileged that much of my accommodation was in the private homes of individuals who led conservation projects, enabling me to learn in an informal manner more about them and their projects.

Some twenty or thirty of the people with whom I stayed or visited agreed to contribute a page to my report ([see the Appendix containing Interviews/Travel Diary](#)). I also took the opportunity to speak with other individuals who were not associated with conservation efforts or had any concern for the environment: restaurant and fast food workers, two hairdressers, a bus conductor, several AirB&B hosts and fellow guests. Their perspective and thoughts were very interesting: many of them had no idea what a monarch butterfly looked like, let alone that it is a national icon and the state insect of Alabama, Idaho, Illinois, Minnesota, Texas, Vermont and West Virginia. Of those that recognised the butterfly some had no awareness of its habitat, life cycle, the amazing migration or that it was under threat.

I gave three presentations at elementary schools and several at Monarch Watch (part of the University of Kansas) as well as a motivational talk (translated into Spanish) at the elementary school at Macheros in Mexico.

Many of the US children were amused when I told them I was a kiwi. They think a kiwi is a fruit and were surprised to learn that all three photographs in my PowerPoint presentation (myself, a kiwifruit, and the bird) were 'kiwis'. They were tickled to learn the story of the kiwifruit, a little about the bird and why NZ citizens were called kiwis.

So far, I have published two pieces in 'BUTTERFLIES' magazine. My report – including the Appendix – has been published on our website. Some of the resources I collected on my travels have been adapted to supplement our own educational resources for schools and gardeners etc. Additional material has been added to the MBNZT's On-line 'Create Butterfly Habitat' course and in my PowerPoint presentation for both schools and adult audiences. I will be delighted to share my presentations with anyone who is prepared to listen, or attend a workshop with me.

Key experiences and highlights are in the full report which can be found [HERE](#).

## Key Learnings

### 1. Habitat Loss

- a. Illegal logging of rainforest in Mexico – Professor Lincoln Brower explained how the intact forest serves as a microclimatic protection of the butterflies (Brower, 2017). The reserves were declared a Biosphere Reserve in 1980 and a World Heritage Site in 2008 and key areas were closed to indigenous people who depended on lumber for their income, cooking and heating. As Dr Pablo Jaramillo López told me, “loggers continue to thin out the forest and reduce their density even though this is a naturally-protected area and a UNESCO World Heritage Site” (Lopez, 2017). Ellen Sharp, an American woman who has with her Mexican husband created an ecotourism business based in Macheros begged the authorities for “... more (full-time, fairly compensated) jobs for people who live on the reserve so they don’t continue to resort to illegal logging” (Sharp, 2017). The rangers were appointed soon after the start of the winter 2017-18.
- b. Loss of wild spaces – the prairies which used to be a wild area with considerable areas of milkweed (the monarch’s host plant) have virtually disappeared. Angie Babbit who works at Monarch Watch, part of the University of Kansas, told me that less than 1% of unploughed prairie remains (Babbit, 2017).
- c. Oversized housing parcels... usually mown (USA) – this was evident throughout the USA with many people building their homes on large sections and then mowing most of the property. Angie Babbit mentioned that settlers from the ‘old country’ have no sense of place. “...everything has been made to look like the English courtyard, with a lush, green carpet surrounded by shrubbery and statues.” She said that the non-natives that are grown do not feed native wildlife and when an insect was seen to be feeding on a prized, ornamental bush, the insecticide came out and eliminated the ‘pest’. “We inherit these ideologies from society, and they become status symbols.”
- d. Production of ethanol – Professor Chip Taylor told me that intensification of land use has been huge since the Renewable Fuel Standard (regulations designed to promote the production of ethanol from corn, to be added to gasoline, 10% by volume) (Taylor, 2017). Angie Babbit commented that this law had driven the agricultural market towards herbicide-tolerant corn and soy.
- e. Avocado production – a relatively new concern is the amount of land being converted from lowland forest or pasture to avocado orchard to meet export demand. Michoacán is the world leader in avocado production (Ray, 2002). This is also putting pressure on water sources in the sanctuaries.

2. Toxic agro-industrial agriculture – as Pablo López explained, in the United States GMO corn and soy crops require highly-toxic insecticides and pesticides, which killed off the milkweed needed to sustain the monarch butterfly. Professor Lincoln Brower agreed, stating that genetically-engineered corn and soybean crops which are engineered to be

resistant to Roundup® herbicide is killing all plants except the genetically engineered herbicide-resistant plants over tens of thousands of acres. This meant less surface area for monarchs to lay their eggs on, and less food for caterpillars. Pablo López said that overall reduction of healthy and clean reproductive habitat has caused the monarch population to reduce by almost 90% over recent years. Lincoln Brower stressed that both nectar sources of the butterflies (and other pollinators) and the leaves for the caterpillars are being exterminated.

3. Pesticide use – Lepidopterist Wayne Richards commented on the amount of pesticides being used by homeowners and the commercial food-growing industry. “...introduced millions of tons of toxins into our soil and water supplies.” (Richards, 2017) Kim Jordan from Wilson Nurseries emphasised that people naturally want their plants to be beautiful. “The use of chemical pest controls that kill anything and everything was widespread and very destructive to the beneficial insect population. You got beautiful flowers but at a cost to the beneficials, bees and butterflies.” (Jordan, 2017)
4. Climate Change – Chip Taylor pointed out that there are several scenarios associated with climate change. “... from increasing temperatures at the overwintering sites that could affect survival of the overwintering monarchs and could change the composition and structure of the forests that protect the overwintering butterflies to increasing temperatures that could negatively impact the return migration in the spring, to severe droughts and high temperatures that could reduce population growth in the summer, as well as survival of the monarchs flying south during the fall migration.” Milli Lattanza mentioned forest fires and Lori Stralow Harris included El Nino. (Lattanza, 2017) (Stralow-Harris, 2017)
5. Ignorance/lack of awareness – while on my travels in the USA I took every opportunity to chat with Americans to see what they knew about the monarch butterfly. I was genuinely surprised to find that many Americans did not know of or about this beautiful butterfly. They did not know that it was a national icon, or the state insect of Alabama, Idaho, Illinois, Minnesota, Texas, Vermont and West Virginia. They did not know about the migration or that the butterfly was under threat. I had a sense that many American people were not particularly interested in Nature or the importance of conservation.

## **Conclusions**

The scientists that I met on my travels agreed that the monarch butterfly’s migration is under considerable threat from habitat loss (including illegal logging in Mexico, and in the USA loss of wild space, ethanol production, and GE crops) as well as pesticide use, climate change and ignorance/apathy.

While the numbers of migrating monarchs are generally decreasing there does seem to be some fluctuation in numbers. The number of butterflies is calculated by measuring the number of hectares occupied by the butterflies at their overwintering habitat. Populations have plummeted by about 90% in the last two decades.

However, there are many people who are putting steps in place to ensure that the migration will continue. The Monarch Joint Venture is a coalition of more than 50 conservation, education and research partners working together on monarch conservation. Their 2008 North American Monarch Conservation Plan is updated annually to help reach the goal of restoring the population to a sustainable level. (Monarch\_Joint\_Venture, 2017)

While much of this learning is not relevant to the monarch butterfly's status in NZ, there were several initiatives which will be very useful when implemented here.

One of the major issues with the survival of the monarch butterfly in this country is that the horticultural industry sprays the host plants (swan plants) sold in garden centres with pesticides to keep the plants clean and saleable and quite possibly garden centres also spray the plants for the same reason. When a swan plant is bought the purchaser can find that their caterpillars die. This is very upsetting for the families who wanted to see beautiful monarch butterflies emerge on their swan plant – as well as being bad for the monarch. Children find it very distressing.

Two garden centres I visited have built separate areas for organic plants and plants destined for birds, butterflies and bees, where you will find plants that are pesticide-free but may not look as pristine as the plants in other sections of the same centre. Another garden centre has specific sections for plants for bees, birds, butterflies and pond life as well as a netted area where you can see native butterflies.

I am currently researching a proposal for the Moths and Butterflies of NZ Trust to implement a campaign to encourage growers and/or garden centres to have pesticide-free plants available in the summer of 2018-19.

In NZ the monarch is a wonderful ambassador for other butterflies, moths and invertebrates. When speaking at garden clubs and in schools, the audience expects to hear about the monarch butterfly but at the end of my presentation are pleasantly surprised to have learned new information and facts about NZ's endemic species

Besides this, there were many ideas shared by educators and conservation experts which will be incorporated into the design of the National Butterfly Centre and/or my presentations to schools and garden clubs.

## **Appendix**

Interviews are in a pdf and can be found on line at

<https://www.monarch.org.nz/wp-content/uploads/2018/02/Appendix-20180202.pdf>

or

<https://tinyurl.com/wcmt-pdf>

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