



The Kirsch Center

For Environmental Studies
De Anza College



Fall 2015

Issue 1



The Monarch Butterfly: A 'Canary in the Cornfield'

~Marissa Kent~

Few insects are as iconic and charismatic as our native monarch butterfly (*Danaus plexippus*). Visits by this large, orange and black butterfly evoke feelings of admiration and wonder, of curiosity and inspiration. It has even been referred to as “the personification of happiness”. Behind this carefree exterior, however, lies an urgent message. Remember the miner’s canary, brought caged into the mine tunnel, whose role was to indicate the presence of poisonous gases before they extinguished the lives of the workers. When the more sensitive canary perished, it was a clear warning that the miners would be next.

The monarch butterfly like the canary is a sensitive organism, and offers us a similar prophecy; it’s total population in North America has dwindled to less than ten percent of its historic



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For Fall 2015.

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numbers in just the past two decades. We can't evacuate, but we can change.

The primary threat to the delicate monarch butterfly is milkweed habitat loss, especially in the Corn Belt of the U.S., where the majority of monarchs originate. Monarch larvae are specialists who feed only on the leaves of milkweeds (*Asclepias* spp.). From these plants, their bodies acquire chemicals called cardenolides whose toxicity to many vertebrate predators provides a valuable defense. Adult monarchs lay their eggs only on milkweeds. The substantial loss of these essential plants is largely due to heavy applications of the herbicide glyphosate to crops like corn and soybeans, which have been genetically modified to be resistant to the herbicide. When acres of these "Roundup Ready" crops are sprayed with this poison, large areas of native milkweed, once thriving at the edges of these monoculture farms, are killed off. Vast swaths of milkweed habitat have been converted to agricultural land to grow these genetically modified crops.

In addition to milkweed habitat, monarchs also rely on particular overwintering habitats. Once seasonal cues alert adult butterflies that it is time to migrate, the population west of the Rocky Mountains travels to coastal California, while the larger population east of the Rockies heads for central Mexico, a journey that can be up to 3,000 miles long. In Mexico, oyamel (sacred) fir forests provide the specific microclimate and flora necessary to support the butterflies, but are threatened by illegal logging and forest disease. In addition, drastic storms and temperature shifts associated with climate change endanger overwintering butterflies, as they cluster together in just a few localized colonies. One severe storm can kill millions.

Monarchs have a whopping 90-99% mortality rate in the wild. Although naturally resilient to predation and disease, the current reduced population size of these insects leaves them unusually vulnerable to these pressures. Monarchs are a significant food source for native songbirds as well as spiders, ants, beetles, and wasps. But the monarch population is now fragile and every depredated individual represents a more significant proportion of the population. Aside from natural predators, a recent man-made 'predator' comes in the form of a chemical pesticide. Neonicotinoids are one of a variety of environmentally persistent insecticides that are not only toxic to farm pests, but also to monarchs and all



Water Bottle Refilling Stations

Make sure you bring your reusable water bottle to De Anza because there are now water bottle refilling stations all around campus. Another step towards a more sustainable campus!



(Continued)

other pollinators, whose services bring us one third of the food we eat.

The issue of disease is compounded not only by reduced population size, but also by habitat fragmentation which leaves small isolated patches of milkweed that increase the risk of disease transmission as monarch larvae are forced to feed in high concentrations, and by climate change which contributes to an overall increase of disease prevalence. In addition, commercially reared monarchs purchased by well-meaning educators also threaten the monarch population by introducing genetically unfit and diseased individuals to the wild population.

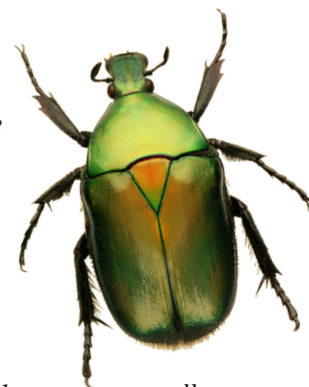
Of particular health concern for the monarch is a parasite known as “OE” (*Ophryocystis elektroscirrha*) that disproportionately affects females. It is spread via dormant spores, which infected butterflies inadvertently disperse on milkweed plants. Hungry larvae consume the spores and they become active, reproducing asexually in the gut of the larvae. The result is dead or significantly weakened butterflies with an associated decreased likelihood of successful reproduction. Certain non-native milkweed varieties, such as tropical milkweed (ex: *Asclepias curassavica*) often planted by home gardeners, increase OE infection risk and disrupt migration. This tropical milkweed species does not die back seasonally, allowing OE spores to persist and accumulate.

The sensitive monarch butterfly is at risk of disappearing forever and its disappearance would have profound implications for our future. Like the canary in the coal mine, the current state of the monarch population in North America portends the condition of all our pollinators and the health of our native landscape, which we rely on to survive. Monarchs are messengers from the cornfields, warning us of the consequences of manipulating nature and degrading the

environment and our food system.

But the monarch has not disappeared. It is still here, its resilience allowing us the opportunity to rewrite the end of the story- to listen to what nature is communicating to us. These unique insects are a part, as we are, of the interconnected web of life on Earth. Our futures are inseparable.

*In Spring 2015, I was grateful to have served as Student Lead of Ryan Phillips’ monarch conservation project at the Kirsch Center aimed at raising awareness and inspiring students, while conserving local monarchs. For this project we collected wild monarch eggs and raised them to adulthood in large, screened boxes with a constant supply of milkweed to allow them a better chance of survival. They were monitored continuously and upon emerging from their chrysalids as healthy adult butterflies, we released them back into the wild to find mates. With the help of student volunteers, we also planted a narrowleaf milkweed patch at the south entrance of the Kirsch Center. If you’d like to plant native milkweed at home, the best choices are narrowleaf (*Asclepias fascicularis*) and shony (*Asclepias speciosa*).*



References and Resources:

- Monarch Joint Venture
<http://www.monarchjointventure.org/>
- The Xerces Society for Invertebrate Conservation
<http://www.xerces.org/>
- Monarch Watch
<http://www.monarchwatch.org/>
- Center for Food Safety
<http://www.centerforfoodsafety.org/>

Trying something new...

Please don't mind our dust. This newsletter is a new idea that we are trying here at the Kirsch Center. We thought it would be a good idea to let you know all about the great work that our current and former students have been doing lately. It's a work in progress. If you would like to be a contributor to the next edition or would like to help in some way please contact me. We are always looking for great students like you to work with on your ideas and projects.

~Thanks!

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SRC hours Fall

Mon- Thurs
9am – 6pm
&
Fri
9am-2pm

Issue 1

Cheeseman Environmental Studies Area (ESA) Pond is complete!

The ESA is open:

Monday – Thursday
8 am – 5 pm
&
Fridays 9am-2pm

