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**Monarch Decline is Caused by Loss in Over-Wintering Habitat**

The monarch butterfly, an insect widespread across the whole of North America and instantly recognizable for its distinctive orange and black wings, is in decline. Numbers of butterflies roosting in overwintered habitat and spotted by citizen scientists and professional scientists alike show a steady decline over the last several decades (Boyle et al. 2019). Monarch decline is not due to declining milk weed habitat, but rather, is due to a decline in the available over-wintering habitat in Mexico. However, this is rather difficult to address, since the declining territory is not in the United States, yet it is possible to do so by joining advocacy groups and donating to specific conservation charities. It is possible to create models that can account for the large amounts of variation observed in monarch butterfly populations throughout the spring and the summer (Inamine et al. 2016). The population of monarch butterflies follows a predictable pattern throughout these crucial early stages of their life cycle and their migration to summer breeding grounds. It is also during this time period that monarchs consume and heavily rely upon milkweed to grow and develop into adults. Since their populations have been following a predictable pattern through these time periods, when they most heavily rely upon milkweed habitat, it is safe to say that this cannot be the limiting factor on their declining population. According to the Inamine article, only during the fall do the different monarch populations deviate unpredictably from the ongoing pattern and decline seemingly without a predictable cause. This is the period in which monarchs migrate south and no longer utilize milkweed, reinforcing the concept that current milkweed conservation efforts are successful and not the cause of declining monarch populations. Therefore, the root cause must be due to declining overwintering territory in Mexico. Furthermore, there are some studies which state that monarch decline may be linked to GMO crops, however, the decline clearly predates this trend (Boyle et al. 2019). However, even though the main cause of monarch decline lies in Mexico, the decline over the course of fall migration could also be linked to modern agricultural practices that rely heavily on pesticides to protect crops, which has knock-on effects on the migrating monarch populations as they move through those regions (Stenoien et al. 2018). Due to the widespread use of chemical pesticides, and their method of application, nearby flowers and other pollinator food sources are coated in them, which causes collateral damage to nontarget species, which includes monarch butterflies, in this case.

 As student conservationists, the prospect of trying to affect change in Mexico and the agricultural industry can be daunting, yet still, it is possible. By further researching the effects of pesticides and habitat decline, we can raise awareness for this magnificent insect and convince industry leaders to choose alternative methods of production to lessen the negative impact on monarch populations. Furthermore, we can join advocacy and protest groups and make our voices heard by attending protests and citizen activism to spur further and greater change, as well as create conservation and restoration projects to protect and rejuvenate otherwise decimated habitat.

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