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For the past several decades, monarch butterflies have dominated both public and scientific interest, due in large part to their unique cross-continental migratory patterns. However, this phenomenon is considered to be critically endangered, as monarch populations have been steadily declining since the 1950’s. Scientific evidence suggests that this decline can be largely attributed to a corresponding increase of herbicide usage in agriculture; these herbicides kill milkweed, the primary food source and egg nursery for monarch butterflies. This trend has only accelerated in recent years with the advent of genetically modified herbicide-resistant crops, allowing farmers to apply herbicides far more liberally than previously possible. Since agricultural practices are unlikely to change in the future, it is my belief that conservation efforts to preserve monarch butterfly populations should focus on planting milkweed in non-treated areas, such as alongside roadsides and between agricultural fields. By ensuring the continued availability of milkweed in this way, monarch populations can continue to survive, and their unique pattern of migration will continue as well.

To begin, it is important to discuss other causes for the recent decline in monarch populations, and why these alternative factors are not as responsible as increased herbicide usage. Historically, a major recognized threat to monarch butterflies was human activities impacting their overwintering site – the entire species spends winter months in an area measuring just 1,800 square kilometers. Logging and the effects of climate change, therefore, would logically stand to severely impact monarch populations. However, these factors alone likely could not explain the decline in monarch populations. In 1980, the Mexican government established the Monarch Butterfly Biosphere Reserve, which has since been expanded further. This has had a major effect on preserving the overwintering habitat of the monarch butterfly. While illegal logging still occurs, this factor alone could not be responsible for the monarch butterfly’s rapid decline. Likewise, while climate change may stand to adversely affect monarch butterflies in the future, there is little evidence to suggest that it has already impacted populations to a significant extent; monarchs seem to be adaptable in their migratory patterns to avoid drought-ridden areas, and while further climate variance may impact populations in the future, it is not the historic cause for their decline.

Increased herbicide usage, therefore, is the primary cause for the decline in monarch populations over the past several decades. Herbicide usage has increased markedly since the 1950’s, a trend only accelerated by the creation of herbicide resistant genetically-modified crops such as soybeans and maize. This increased herbicide usage has dramatically reduced the availability of milkweed, the sole food source and egg nursery for monarch populations. Certain citizen-led scientific surveys have indicated that monarchs are still found at their historic densities in milkweed patches, and therefore this loss is not the primary cause for the decline in monarch populations. However, while monarch population densities may still maintain their historic values in remaining milkweed patches, this does not mean that there is no population loss. If there were historically ten milkweed patches with ten monarchs located in each, then finding one milkweed patch with ten monarch butterflies in it does not mean that there was no population loss; rather, there has been a 90% population loss. Data shows that milkweed patches have declined in this way, indicating that increased herbicide usage exceedingly detrimental to monarch butterflies. Since this agricultural practice is unlikely to change in the future, however, conservation efforts should instead focus on ensuring that milkweed is planted uniformly across land free from herbicide usage.

Milkweed planting stands to benefit monarch butterfly populations in several ways. First, it is an easily accessible and non-labor intensive form of conservation; it involves no special equipment or training, just a handful of milkweed pods. Second, it encourages the participation of farmers, without requiring them to change their agricultural practices. Milkweed could be planted by farmers in the margins between fields or near roadsides alongside other native plants, which would not be adversely affected by herbicide usage. Moreover, research has demonstrated that these natural field margins have a notable benefit for agriculture, acting as a repository for beneficial insects like ladybugs and revitalizing soil exhausted by crop. Conservation efforts should therefore focus on ensuring that milkweed remains readily available across the entirety of the monarch butterfly’s range, in order to ensure that the species and their unique migratory patterns continue into the future.

**Citations:**

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