

The Numbers Game- by Jim Price

The odds monarch butterflies face are daunting, but there is reason for hope

What does one acre look like? How big is it in your mind?

Well, it's easy to visualize if you're a fan of the Green Bay Packers, Bucky Badger or any other football team. The playing area of a football field, not counting the end zones, is just a bit over one acre. If you do add in the end zones and the sideline bench areas, you have about an acre and a half.

What's this got to do with monarch butterflies?

In the winter of 2013-14, over wintering monarchs in Mexico were measured as occupying trees covering 0.67 hectares. A hectare is approximately 2.5 acres. So all the monarch butterflies that reached Mexico from two thirds of the North American continent – from the Rocky Mountains to Nova Scotia – fit onto 1.675 acres, or just a little more space than it takes to play a regulation football game.

The largest area occupied by monarchs in Mexico since such measures have been taken was about 21 hectares, or just more than 50 acres. That was 20 years before. It still may not sound like much space to contain all of our eastern American migratory monarchs, but keep in mind that they roost *very* densely, and so the actual number of individual monarchs in that roosting was estimated at about 1 billion. The 2013-14 estimate was 50 million. If those estimates are anywhere close to accurate, that is a 95 percent drop in numbers over 20 years. Most scientists put the figure a tad more conservatively, at a 90 percent reduction.

Either way, the population numbers are alarming. And so are the habitat numbers, which too many of us seem to correspond.

Since the monarch roosting sites in Mexico were discovered by biologists in 1976, the massive alteration of the Midwestern American landscape begun by European settlers a century and a half before has continued apace. Just since 2006, on average, about 250,000 acres of pasture and meadow has been converted *each year* to row crops, principally corn and soybeans.

Here are four more related numbers: Common milkweed reigned as the No. 1 weed in agricultural fields and pastures for the first two centuries of agriculture in the Midwest. In "average," or the total weight of any uncultivated plant species in a given cultivated space, nothing topped milkweed. It was the boss weed, more prolific and persistent than any other.

Second number: According to tagging studies, 50 percent of all monarchs that reach Mexico come from the Upper Midwest states, once known as the Prairie States, now known as “the Corn Belt.” This former prairie province was and remains the primary breeding ground for eastern U.S. migratory monarchs.

Third number: According to estimates based on 40 years of research, 90 percent of all eastern American monarchs were reared on common milkweed growing on agricultural lands, whether in pastures or cultivated fields.

Fourth number: Since their widespread introduction early in this century, herbicide-resistant crops of corn and soybeans have replaced non-herbicide resistant crops on up to 90 percent of all crop acreage in the Midwest. And milkweed can no longer persist under repeated applications of this herbicide.

The combination of wholesale conversion of pasture and grassland to cropland, and the broad-scale introduction of herbicide-resistant crops on all those millions of acres, as well as on the hundreds of millions more acres that had previously been planted in non-GMO crops, has reduced available food resources for monarch caterpillars by 90 percent.

Does this number, 90 percent, begin to sound uncomfortably familiar?

The unfortunate truth is that industrial-scale agriculture is not going away, and the practices used are not going to change. In fact, more acres are still being converted, new herbicides are still being developed, and more crops genetically resistant to those herbicides are still being bred.

So, the numbers suggest that the odds are significantly against the recovery of historical monarch numbers in both the short and long terms. And if we look only at those numbers, we may have to admit that, while the migratory population of eastern U.S. monarchs may not disappear altogether, it may never again approach those historic peaks.

But there are other numbers worth considering – such as the number 1 million. That’s the number of years most researchers believe that monarchs and North American milkweeds have been co-evolving toward their current forms. It is also approximately the length in years of the Ice Age, in which massive continental ice sheets four times wiped out all milkweed and monarch habitat throughout the Midwest. We can rest assured that during at least those four glacial advances, each lasting tens of thousands of years, there were absolutely no monarch butterflies in Wisconsin, or anywhere else north of, perhaps, the Ozark Mountains.

Surely, during the dynamic and often catastrophic course of that 1 million years, when the Earth's climate swung radically back and forth, through periods of extreme cold and drought, there must have been times when monarch numbers crashed. Just as surely, there have been other times when their numbers soared during mild interglacial periods.

Those of us who have been around awhile have been privileged to enjoy what may have been a peak period in the natural history of the monarch butterfly – a time when a mild climate, combined with a riotous proliferation of common milkweed across the landscape, produced ideal conditions for monarch reproduction. But we now face the sad fact that this Golden Age of the monarch has precipitously ended, and it is not due to some natural cause – not periodic extreme cold or drought – rather, it is entirely our fault.

Never before did the monarch need the help of another animal species to recover from a population crash. But never before was there another animal species able to consciously offer that assistance. We brought on the crisis, and only we can resolve it, either for or against the monarch.

The hope, then, lies both in the remarkable and proven resilience of the monarch and in the extraordinary ability and will of humankind to alter the course of natural history. What we have done, we can also undo. We have converted hundreds of millions of acres of prairie into plowed fields. We have the *ability* to convert hundreds of millions of acres of roadsides and rights-of-way back into prairie, if only we have the *will* to do it.

The numbers game goes on. If 100 people were each to plant a 400-square-foot pollinator garden including milkweed, they will together have recovered almost 1 acre of monarch habitat. It isn't much. But if 1 *million* people do it, they will have recovered almost 10,000 acres. If 10 million do it, 100,000 acres. And so on.

And if, in the meantime, every Midwestern state commits resources to roadside prairie restoration, utility right-of-way restoration, state property restoration, etc., the numbers do begin to add up to the possibility of recovery toward historic highs.

It is all within our ability to do and requires only the will. Because if there is one thing that humankind has proved, it is that anything we really set our minds to do, for good or for ill, will most surely get done.

On Monarchs and Milkweeds

Our Mantra for Monarchs

Monarchs need milkweed.

That's the one thing, the first thing, every newcomer learns when he or she takes the step toward becoming a steward of the monarch butterfly.

"I love monarchs," they tell us. "I hear they're in trouble. I want to help.

"And I understand that monarchs need milkweed."

Yes, they do. That tidbit of knowledge is unquestionable. Whatever we may still *not* know about monarch butterflies, there is no doubt whatsoever, monarchs need milkweed. It is the only plant on which the female monarch can lay her eggs, the only plant the caterpillars hatched from those eggs can eat.

No milkweed, no monarchs.

So, if you've heard about the plight of the monarch butterfly – their rapidly declining numbers throughout most of North America – and you want to help, the first thing you must know is that *monarchs need milkweed*.

And guess what? It is also the last thing you *have* to know.

The science is in. Over the past 40 years, an astonishing amount of research has been undertaken to understand the life cycle of the monarch and its amazing migration. The science has advanced from simple field observation of the insect's habits to advanced biogenetics and computer modeling. Investigators have teased out the methods by which monarchs navigate on their long migration paths (although still, knowing *how* they do it hasn't really given us a clear answer as to *why* they do it).

Over the past 10 years, while such fundamental research has continued apace, new efforts have been launched toward another aspect of monarch biology: Why are they suddenly, rapidly, alarmingly, disappearing?

That science is also now in. Here is the astonishing finding of that research:
Monarchs need milkweed.

This year, [Monarch Watch](#), based at the University of Kansas and perhaps the leading monarch research center in the nation, issued an outline [Monarch Butterfly Recovery Plan](#). The result of decades of data collection, gained through tagging, mapping and many other methods, concluded that we, as a nation, as a people, have so radically altered the landscape of the American Midwest that there is no longer enough food for monarchs to eat. That is, monarchs are running out of milkweed.

The long-term goal for recovery, then, is as simple as it is daunting: We must somehow replant millions of acres, from the Great Plains to the Appalachian Mountains, with milkweeds and nectar plants.

How we will do this, where will we do it, *how we will pay for it* – these questions right now have no answers. But that is the task.

In future Monarchs and Milkweeds articles, we at the Friends of the Monarch Trail will discuss the details, point by point, of how this conclusion has been reached. But for now, we can only repeat that conclusion and raise the call to action.

Monarchs need milkweed.

If you have a garden, plant milkweed in it. If you have a large property, dedicate a large space to milkweed and butterfly-friendly wildflowers. If you own a business, tear out those boxwood bushes and replace them with a pollinator garden. If you own a farm, stop with the herbicides and let some milkweed grow along your fencerows.

If the place where you work has a large, manicured property, start a committee to replace lawn space with monarch space. If you live in an apartment, get together with your neighbors and ask the landlord to let you take over that patch of turf you all share.

Volunteer to help plant milkweed and nectar plants in public spaces. Friends of the Monarch Trail planted thousands of milkweeds and wildflowers this year on the County Grounds, and donated thousands more to the Milwaukee County Parks Department, which planted them in new pollinator beds in Grant Park. We are by no means done. There are many more acres to replant on the County Grounds, and 143 more parks in Milwaukee County.

Monarch Watch grew more than 50,000 milkweed “plugs” this year, and by the end of May had already distributed 30,000 of them across the nation.

As good as that sounds, Monarch Watch knows, and we know, that these efforts so far are tiny drops in a very big bucket. Much, much more has to be done, on an enormous scale, a continental scale. Yet even those who simply cannot physically plant milkweed can help.

If you are able to give, [Friends of the Monarch Trail](#) or another organization that supports monarch recovery. If you can write a letter or an email, ask your alderman, your school board members, your county board supervisor, and urge them to lead a charge for pollinator gardens on every public space.

Tell your state assembly representative and senator it's time Wisconsin got on board, because our state is at the heart of America's principal monarch nursery, the northern prairies.

Write to your U.S. Congressional representative and demand some action to modify agricultural policies to give monarchs and other wildlife a chance to survive.

Above all, write to your Department of Transportation and urge that its policies change to reflect the plight of not only monarchs but all American pollinators. There are 3 million miles of rural roadways between the Rocky Mountains and the East Coast, every mile with 30 to 40 feet of unused space on either side. Monarch Watch has identified roadsides as the single largest and most available space to restore the millions of acres necessary to any recovery plan.

Tell the DOT to adopt or accelerate a roadside prairie planting program with a diversity of milkweed and native nectar species, and curtail mowing and herbicide spraying practices that demolish any wild populations that are already there.

No matter who you are, how old you are, where you live, how physically able you are, there is something you can do, because you have a voice. You can become a powerful force for monarch recovery if you do no more than use that voice to tell anyone and everyone you meet the one thing they need to know:

Monarchs... need... milkweed.

Jim Price writes on Monarchs and Milkweeds for the Friends of the Monarch Trail.