

“Tertiary Rewilding in Northern Wisconsin”

2010 report by MICHAEL HEIM of his onsite project

My name is Michael Heim and I am addicted to growing all kinds of odd and interesting plants outdoors. I'm curious to find out if they can handle our harsh climatic conditions here in (brrrr!) northern Wisconsin in what used to be USDA Zone 3, but is now Zone 4, although wild swings in the weather do seem to be more common now.

One of my favorite pastimes is **attempting the rewilding of plants which used to grow in northern North America during the Tertiary Period**, but for whatever reason went extinct with the arrival of the Pleistocene, hanging on in other parts of the world such as Asia. I've been interested in fossil plant life ever since as a kid my family and I would go on regular Sunday excursions to the strip mines south of Chicago looking for fossils from the long-vanished world of the Coal Age, when Illinois was near the equator and attached to Europe. Many years later I was privileged to go on a university expedition to western North Dakota to collect the remains of a 60 million year old forest. The single layer of deciduous tree leaves, seeds, and twigs had apparently been torn off in a storm and deposited in a pond or lake having abundant cattails. In attempting to grow their nearest living relatives, e.g. **Ginkgo biloba, Taxodium distichum, Cercidiphyllum japonicum, Pterocarya rhoifolia**, I discovered that all were extremely cold-hardy. Now, inevitably when one sees reconstructions of prehistoric ecosystems in books, they are portrayed as tropical to subtropical, unless of course they are of the “Ice Age”. Never, for instance, have I seen a January landscape of North Dakota, some sixty million years ago. So here then is a topic sorely neglected by paleontologists and paleoecologists: the winter survival of plants and animals in the distant past at temperatures which at times likely fell well below zero F. As you can tell, I'm particularly interested in prehistoric ecology and environments.

Living in a part of the country which currently has fairly high biodiversity made me wonder about what might have lived here in preglacial times. **Within half an hour's drive of my home are cedar swamps dripping with epiphytic mosses and lichens resembling Spanish-moss, to deep, dark climax forests of hemlock, yellow birch, sugar maple, butternut, etc., to jack pine and scrub oak savannah with prickly-pear cacti.** My family's 65-acre property alone has three species of native pines in the wild, two of spruce, three of oak, two of ash, and three of maple. Since we were covered by thick ice sheets until about 12,500 years ago, all of these species have arrived here since then.

The hemlock, for instance, only arrived here within the last 1,000 years and others, such as the American chestnut, disperse so slowly that they have not quite reached Wisconsin yet or are unable to cross

intervening stretches of unsuitable soils. Our biodiversity must therefore have been astonishingly high during the Tertiary. So what I am trying to do is **aid these taxa in recolonizing their ancestral haunts, a kind of "range reclamation"**. This increase in plant diversity will benefit wildlife by providing alternative food sources and when wildlife benefits, people benefit.

I'm a science teacher at a local tribal high school. My students and I are working on a long-term project in conjunction with the National Arboretum. It involves the naturalization of box huckleberry, a rare plant at present which likely thrived on the sandstone of northern Wisconsin during the Tertiary (see my article "Return of the Ericads: Students Dig and Reestablish a Prehistoric Species" at <http://www.TorreyGuardians.org/box-huckleberry.pdf>). The plants are doing extremely well and are now in their second year.

In the varied forest of my own property I've been monitoring the progress of a number of **reintroduced Tertiary taxa** for about thirty years, including the genera **Actinidia, Symplocos, Shortia, Castanea, Nyssa, Rhododendron, Kalmia, Sassafras, Magnolia, Stewartia, Schisandra, Lygodium, Berberis (Mahonia), Pachistima, Taxus, Cephalotaxus,** and **Torreya**. All are doing quite well so far. Their biggest threat comes not from the climate, but from overabundant deer, which are actually relative newcomers here, having come across the Bering land bridge from Eurasia.

The genus **Torreya** is of particular interest, being a well-known disjunct. I found that *T. taxifolia*, native to the southeast, does not survive the winter here, rotting off at the base. Apparently it is intolerant of winter-long snowcover. However, the Japanese *T. nucifera radicans* thrives here and is in the process now of putting on vigorous new growth, so a related form may have grown here in the past.

I've also had some interesting results with **Ginkgo**. Even though it is an extremely long-lived tree and can even survive an atomic bomb blast, it is definitely a pioneer species. None of the seed which I planted in the woods and germinated or the transplants survived for more than a couple of years, even on a south-facing slope. The tree in our yard took -45F with no injury whatsoever, but a portion of its top died back both when we had an open snowless winter and then again after an unusually cool summer. The cool summer also hammered some, but not all, of the **baldcypresses** and caused some twig dieback on **Metasequoia**. The other Tertiary trees were fine. Apparently those suffering injury favor lower elevation sites in the north, such as in major rivers valleys, where they experience long hot summers and occasionally bitter cold winters.

I welcome feedback and would be particularly interested to hear of other people's similar projects. I can be reached at 4heim@cheqnet.net.