

This text is a reprint of the “Creating a Monarch Highway” article posted to the Monarch Watch Blog (monarchwatch.org/blog) on 1 December 2015. Direct link: monarchwatch.org/highway

Monarch Butterfly Recovery Plan: Part Two

by Chip Taylor, Monarch Watch

My first attempt at outlining a monarch recovery plan was written in March 2014 (monarchwatch.org/recovery-plan). Although monarch conservation has been discussed at federal and state levels as well as within and among NGOs for >18 months, no specific habitat restoration plans have emerged from these discussions. By “specific” I mean the where, when, and how of restoration with consideration of all the capacity and implementation issues mentioned in the earlier text. These discussions are moving in the right direction, but a little too slowly for me. If you read the earlier blog article, you might recall that I pointed out that the annual rate of habitat loss for monarchs is probably 1-1.5 million acres. This means that for every year we don’t offset the loss of at least a million acres of habitat, we can expect the monarch population to decline further.

I have put together a brief memo (below) describing a concept for how we might configure I-35 as a Monarch Highway. This memo is intended to be a starting point for discussion. Although the memo describes how we might proceed with habitat restoration for monarchs and pollinators along our highways, modifications of this plan could be applied to other right of ways (ROWS), as well as public and private lands.

Notice that I have used the word “we” in the above and you will find “we” scattered throughout the memo. I’m using the word in the collective sense. I’m assuming that WE are all in this together.

The memo is brief and many details are missing. Before adopting this plan, details such as specific costs, planting protocols, crew sizes, site preparation that fits different soils and plant communities, planting times, and maintenance schedules (including watering) would have to be established. Further, all the cost estimates are based on those that would be incurred on private lands for projects of similar scope. State and federal agency costs could be minimal but then again, they could double the cost of the entire operation depending on their level of involvement. Firming up the overall estimated costs of the project would be one of our first priorities.

If we assume that the I-35 concept is of general interest, we still have to answer a series of significant questions before initiating the next steps.

Here are a few of these issues:

- 1) Assuming that strong centralized leadership is needed, what NGO or agency would take the lead?
- 2) How would we negotiate our way through the various state and federal regulations that apply to such a project?

3) Many miles along I-35 are not amenable to restoration and restoration sites need to be selected carefully. This is a reality that would require creation of site selection protocols and perhaps teams trained to identify high quality sites.

4) Working along I-35, especially if volunteers are involved, would require special attention to safety protocols. Alternatively, the planting could be carried out by state personnel or firms working under contract.

5) There are budget issues as well and they could be complicated and crippling unless the process is thought through very carefully.

MEMO: A PROPOSAL TO CREATE A MONARCH HIGHWAY

Restoration of milkweeds and nectar sources for monarchs and pollinators along I-35

Over the last decade monarch numbers have spiraled downward due to the loss of habitat. The very existence of the monarch migration may be threatened. Studies of the annual cycle of the monarch population indicate that the most important region supporting this species is a corridor of milkweed and nectar resources that ranges from Texas to Minnesota. This passageway has been referred to as the I-35 corridor since this Interstate Highway spans most of the region. While it is clear that restoring the monarch population will require habitat restoration on a massive scale, it is also apparent that this effort needs a symbol that will continue to engage the public as well as state and federal agencies in monarch conservation. I-35 can be that symbol.

This brief memo outlines a plan to create milkweed/native plant/monarch habitats along the entire 1400-mile length of I-35 that can become known as “The Monarch Highway”. In the paragraphs that follow, I have outlined a 5-year plan that includes planting options, costs and potential funding. An important component of the plan involves monitoring of both the planting and the use of these sites by pollinators and monarchs. Depending on the funding available, the project is scalable with total costs ranging from a minimum of 3.5 million dollars to over \$10 million.

Planting Options

There are two planting options: plugs and seed mixes. For costs and capacity considerations, I’m going to use two area units: 1) 10’x100’ strips for plugs and 2) acres for seed mixes.

Plugs

A 10’x100’ plug plot would be populated with 800 plugs of 16 species (including two milkweeds and some over-seeding with native grasses) at a cost of \$2,500 each or \$3.5 million to establish one plot for each mile of the 1,400-mile length of I -35. The costs would include site preparation, plugs, signage, and associated fuel and administrative costs. I’m assuming that citizens would do the planting and that no labor costs other than a supervisory cost would be involved. Two such plots per mile would be preferred for a cost of \$7 million.

Producing the 2-3 million plugs required for two plug strips per mile is presently within the capacity of restoration nurseries – they would just need the orders. We would start in the north where there is more capacity (seeds and nurseries) and support for restoration and work toward the south in successive years.

Seed mixes

The cost of restoring 1 acre per mile with seed mixes would range from \$2,000 – \$3,600 per acre for totals ranging from \$2.8 – \$5 million. The variance in the cost is related to the species richness of the seed mixes and costs of specific seeds as well as site preparation and planting methods. Seed mixes are more problematic for several reasons – lower success rates, scarcity of seeds appropriate for certain regions of the country, and the need for specialized equipment to prepare the sites and drill in the seeds. There is currently enough seed to start such a project in some areas of MN and IA but seeds are more limited in other areas. Citizens would not be involved in the establishment of such sites but could be involved with their maintenance through “Adopt A Habitat” programs (weeding, etc.).

Monitoring

Monitoring plant survival and recording insects and other wildlife in restored plots could be done by teams of interns in each of the six states along the highway. Generally, if you create a diverse plant community, you eventually establish a diverse insect community. We would need proof of concept and assessment of the relative success of different plant species as well as management practices. The effectiveness of these plots as habitats for pollinators and monarchs would also be evaluated. These monitoring efforts are relatively straightforward and it shouldn't be too difficult to establish the numbers of plants and pollinators in these plots.

Plants

Once plants or seeds are in the ground, we will determine the success of each restoration effort. We will monitor each planting in the fall and the following spring for the survival of plugs of each species. Seeding operations will also be monitored for plant survival. Success rates will be assessed for each planting and maintenance protocol. Threshold standards would be established to determine whether sites require replanting with plugs or need reseeding.

Bees

Small bees visiting the restored sites can be sampled with “pan traps”, e.g., blue and yellow plastic bowls. These bowls are placed on the ground near blooming plants within the habitats for short timed intervals. The bowls contain a ¼ inch of soapy water (or some other fluid). Bees are attracted to the color and dive into the liquid and drown. At the end of the sampling period the bees are removed from the fluid and stored in “hand sanitizer” (or similar preservative). The name of the collector, location, date, time and conditions are recorded for each sample and the bees are sorted by species and identified later. A recent publication shows that there is no measureable negative impact on the insect populations sampled this way.

Macro pollinators

Sweep netting and timed visual scans are used to assess the presence and abundance of larger pollinators.

Meter-long sweeps (10-20 per location) with a standard insect net through the flowering vegetation are used to collect insects that are smart enough not to be trapped in the bowls. Again, the insects sampled are killed, labeled and sorted later.

Timed visual assessments (how many of x, y and z are seen per 1 min or 5 min intervals) account for insects that are unlikely to be collected by other methods.

To demonstrate the differences between restored and unrestored plots, the same procedures are conducted in control plots (those with normal vegetation for the area) either by another person or by the person conducting the first sample but in sequence. For example, the pan traps could be placed in one location and then set up in the second location while the first set is catching bees. Then, the first set is picked up while the second set is catching bees. Following that, the areas could be swept and visually sampled. Someone who knows how to conduct such surveys could finish a site in an hour, maybe less. A team of two interns could finish the job in 40 minutes. The time-consuming activities are sorting and identification of specimens.

Monitoring for Monarch Activity

The use of these habitats by monarchs can be assessed by one or more people prior to the other sampling. Each milkweed plant would be visually inspected for eggs and larvae and signs of leaf damage. In the plug plots the species are clumped (4-5 per clump) rather than randomly scattered. Therefore, the 100 milkweeds in each plot would be distributed in 20-25 clumps. The clumps would be flagged and numbered, allowing them to be easily found and assessed on repeated visits.

Much of the above sampling is weather dependent. The egg and larvae surveys can be done under a variety of conditions but there are sunlight, wind and temperature conditions to consider for the other sampling methods.

Sampling would only be conducted at 10-20% of the sites with three visits planned to the selected sites each year. Additional visits might be required if there are specific targets – such as the number of eggs and larvae on milkweeds from 20 July-10 August for areas north of 38°N (northern Kansas). Eggs laid during this period produce the adult monarchs that migrate from the northern breeding areas in August and September.

Funding and Cost Sharing

The costs of this project range from \$3.5 to >\$10 million, depending on whether the restoration is accomplished with plugs or seeds or some combination of both methods. Public and private funds could be raised to support this project. State (N=6) and federal agencies should be able to provide funds to cover the costs associated with their specific contributions to the project (e.g.,

administration, supervision, fuel, equipment), up to half the total costs. Additional funds could be obtained through foundations, corporations, businesses, crowdfunding, aluminum drives, pennies for monarchs, and other fundraising solicitations.

Timeline

This project could start in 2016 with some test plots along I-35, another highway, or even on private land with a modest investment. The complete project would require five years. Restoration would start in the north using plugs at first but transitioning to seeds in places where they are available (mostly in MN and IA) and then progressing southward as funds, plugs and seeds become available.

Potential limitations and barriers to success

This project will require:

- 1) Strong, centralized leadership with support from federal and state agencies.
- 2) A well-developed fundraising program.
- 3) Cooperation among federal and state agencies as well as NGOs and citizens.
- 4) An assessment of the regulations governing the composition of seed and plug mixes for each state.
- 5) Support for monitoring efforts and assessment of the data.
- 6) Publicity designed to draw attention to these efforts and to encourage land management practices that support monarchs and pollinators.

Benefits

The number of monarchs in Mexico each winter is largely determined by: 1) the number and reproductive success of monarchs reaching Texas and Oklahoma the previous spring, 2) the number and timing for the first-generation monarchs reaching the northern breeding areas (>38°N), and 3) the summer temperatures. The milkweed and nectar plant habitat supporting this population is a funnel-shaped area that widens from Texas to the Canadian border in the Upper Midwest. I-35 extends the length of most of this passageway and therefore is symbolic of what needs to be both maintained and restored in the milkweed/monarch corridor. Establishing monarch/pollinator habitats along the entire length of I-35, along with appropriate signage and publicity (thus creating “The Monarch Highway”) will strongly communicate the need to maintain the integrity of the system that supports monarchs, pollinators, and other species sharing these habitats.