Unlike people, butterflies cannot bring their food with them when they go traveling. That means that, if a female travels far from her place of birth and doesn’t encounter a plant that her offspring are able to eat, there will be no viable offspring, and no population of butterflies of this species. So, to restate the obvious, the existence of a population of a particular species of butterfly is completely dependent upon the existence of a population of plants that the caterpillars of the butterfly species can eat (it also may depend upon nectar sources for adults, along with many other factors).
Some caterpillars of some butterfly species are able to eat many species of plants, sometimes in many different plant families. Other butterflies, such as Zebra Swallowtails (page 4), can use a set of closely related plants, such as pawpaws. Still other butterflies, such as Northern Metalmark (page 12), are restricted to a single species of plant.

While no butterfly species can have a reproducing population outside of the range of its foodplants, the ranges of some butterfly species are roughly co-extensive with the ranges of their caterpillar foodplants (see Zebra Swallowtail, page 4) while the ranges of other butterfly species are much narrower than that of the caterpillar foodplant (see Northern Metalmark, page 12).

In this article I compare the known ranges of selected butterfly species and their caterpillar foodplants, hoping to uncover research areas where future work might be productive and geographical areas where planting particular plant species by butterfly gardeners might expand the range of particular butterfly species.

The ranges of butterflies that are shown as turquoise, purple, and/or orange color blocks, or alternatively outlined in black lines, are taken from my forthcoming book, A Swift Guide to Butterflies of North America (in press). Butterfly ranges shown by counties are based largely on the county atlases at www.bamona.com. These maps, along with the county plant maps, published by the United States Department of Agriculture at www.plant.usda.gov, are useful for visualizing the approximate range of a species. Keep in mind, however, that counties, especially in the West, can cover a lot of territory and if the range of a butterfly or plant is only at one edge of the county, a county map can give a distorted view of the range. In addition, both the butterfly and plant county maps suffer from the twin drawbacks of under-reporting of counties in which the butterfly or the plant actually occurs and of mistakingly reporting the butterfly or the plant in a county in which it does not occur.

Zebra Swallowtail

With their black and white stripes and long tails, Zebra Swallowtails are very attractive butterflies. And, in order to have Zebra Swallowtail, you must have pawpaws, because Zebra Swallowtail caterpillars feed only on species in the genus *Asimina* — pawpaws. On page 5 you can see that the range of Zebra Swallowtails is essentially the same as the range of pawpaws.

While many factors go into the distribution of species, for plant species probably the two largest factors are annual rainfall and minimum winter temperatures. This suggests that pawpaws can be grown west and north of the existing range by using irrigation westward and by careful siting and/or winter protection of plants northward.

By looking at the map on page 5 you can see that Zebra Swallowtails not infrequently stray outside of their normal range. Thus, by planting pawpaws in your garden just west or north of their existing range, you not only can enjoy the wonderful pawpaw, you also have a very good shot at attracting Zebra Swallowtails into your garden, and thus extending their range.

Desert Elfin

While Zebra Swallowtails are inhabitants of the moist southeast, Desert Elfins (page 7) are denizens of the arid southwest. The caterpillars of these perky, spring-flying hairstreaks feed only on Stansbury Cliffrose, a beautiful shrub/small tree in the rose family. My guess is that the ranges of the butterfly and the plant are actually co-extensive.

If you live in the area of Flagstaff, Arizona, or of Grand Junction, Colorado, you might consider planting Stansbury Cliffrose, which can occasionally be obtained from nurseries or other naturalists.
Great Purple Hairstreak

This butterfly, with its large size and iridescent blue topside, is one of our most spectacular haistreaks. As such, it is a butterfly that most enthusiasts want to see and, if possible, have in their own gardens. The trick here is being able to grow mistletoes, the caterpillar foodplants. Mistletoes are semi-parasitic on a variety of trees. That is, they do have green leaves, and thus can produce their own food, but rely on the hostplant for water and other nutrients. Unfortunately, so far as I know, no one is cultivating native mistletoes.

As with the previous two species, the range of Great Purple Hairstreaks appears to be co-extensive with the range of the 14 species of mistletoes native to the United States. The many counties in Tennessee, Mississippi, etc., where neither the plant nor the butterfly has been recorded, probably more reflects the ranges of butterfliers and native plant enthusiasts more accurately than it describes the ranges of the butterfly and plants.

In the northeast, there are historic reports of Great Purple Hairstreaks from New Jersey and from Long Island, New York. Apparently, mistletoes have declined greatly in New Jersey over the past 75 years.

If you can figure out how to propagate mistletoes and establish colonies of mistletoes in your neighborhood, you might be able to enjoy Great Purple Hairstreak right at home!
Pipevine Swallowtail and Gulf Fritillary.

These two species provide perhaps the most interesting comparisons of foodplants and butterfly ranges. Curiously, the distribution of pipevines and passionflowers is quite similar. To me, the most striking thing about the two maps on page 11 are the large (turquoise) areas in the West that are north of the foodplant ranges but where Pipevine Swallowtails and Gulf Fritillaries regularly immigrate into in most years. This contrasts with the situation in the East where the butterflies either normally occur north to the end of the foodplant range (Pipevine Swallowtails) or don’t even normally occur as far north as the foodplant (Gulf Fritillary). Perhaps there are greater numbers of Pipevine Swallowtail and Gulf Fritillaries in Texas than in the Southeast? Or perhaps the quality of the foodplant differ by region? Readers are invited to submit their own hypotheses.
Northern Metalmarks are scare and local, despite the wide distribution of their foodplant.  

Unlike the previously treated species, Northern Metalmarks have a much more restricted range than does their only caterpillar foodplant, Roundleaf Ragwort.

Studies suggest that in order for a population of these metalmarks to thrive, the ragworts need to be growing on limestone soil in partial sunshine.

Soapberry Hairstreak
This is yet another species that seems to occupy most of the range of its foodplant. But note that soapberry ranges east and south of the butterfly’s range. Perhaps those plants are different or perhaps the butterfly is restricted by other factors, such as rainfall. NABA has planted soapberry trees at the National Butterfly Center and continues to hope!

Distribution of Northern Metalmarks and of Roundleaf Ragworts
Green line is approximate range limit of the range of Roundleaf Ragwort. Colored areas indicate range of Northern Metalmarks: purple = two broods; turquoise = one brood

Distribution of Soapberry Hairstreaks and of Western Soapberry
Counties where only the plant is recorded are in yellow; Counties where only the butterfly is recorded are in blue; counties where both are recorded are in green; black line is actual current range of Soapberry Hairstreak.

Northern Metalmark
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