The Beguiling Butterflies of the Jackson County Pine-Oak Barrens by Ann Swengel

The great butterflies of the central Wisconsin pine-oak barrens were previously described in the fall 1998 issue of *American Butterflies* ("Definitive Destination: Pine-Oak Barrens in Central Jackson County, Wisconsin"). With a decade already elapsed, I'd like to update that information. The map on page 3 is reprinted from that article, with kind permission from the North American Butterfly Association (NABA). For scale, note that it is 1.5 miles on Brockway Road between Bauer and Castle Mound roads.

Looking for butterflies in Wisconsin is particularly dicey in spring, but challenging season-long. It's a rare year when my co-researcher Scott Swengel and I have a comfortable time getting all our field work in at the right timing at all the sites we want to check for their special butterflies. Many a time a perfect weather forecast from just the night before completely misportrays the dismal weather that actually happens. It helps to have some backup plans. If the weather is poor in one spot, it might be tenable somewhere else within reach that day. On the other hand, perfectly fine butterfly weather sometimes occurs on days with dismal forecasts—all just to keep us gambling about what might happen next! We appreciate your understanding that on our field days, we are very busy completing formal butterfly monitoring surveys. If you see us, we greatly appreciate your understanding that we need to continue our surveys uninterrupted, as we never have enough time when the weather and timing are right!

About the author

An enthusiast of butterflies since childhood, I became serious about them in the mid-1980s, with the encouragement of ornithologist Scott Swengel, whom I met then and subsequently married. Field partners in bird and butterfly surveys ever since, we've studied prairie butterflies in seven states, as well as Wisconsin's barrens and bog butterflies. We've published a number of peer-reviewed scientific papers on butterfly detection, habitat associations, phenology and fluctuations, and responses to site management, as well as non-technical articles. A past vice president of NABA and co-editor of the annual 4th of July Butterfly Count report, I am currently honored to serve on the editorial board of the *Journal of Insect Conservation*.

Acknowledgments

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Why is this area special?

During the last Ice Age, most of what is now Jackson County in central Wisconsin barely escaped the glacier's farthest advance. Nonetheless, the effect of the nearby ice sheet was great, via glacially generated sands deposited by wind and water. The modern-day consequence is dry and infertile soil. Inhospitable to agriculture, extensive areas remain as relatively undeveloped land dedicated to forestry and recreation, but also abounding in fascinating butterflies.

These sandy areas support jack pine-oak barrens, a combination of scattered trees, groves, and brush amidst extensive prairie-like vegetation. This diversity of flora offers a smorgasbord of caterpillar food plants. Native grasses nourish an array of skippers, from the spring-flying Cobweb and Dusted to the fall-flying Leonard's. Wildflowers cater to others, such as sunflowers and related plants for Gorgone Checkerspot, and wild lupine (*Lupinus perennis*), which alone has three specialized butterflies: Frosted Elfin, 'Karner' Melissa Blue, and Persius Duskywing. Shrubby heaths sustain Pink-edged Sulphur and Hoary Elfin, while brushy oaks abound in Edwards' Hairstreak. *Ceanothus* bushes (redroot and New Jersey tea) provide for the elusive Mottled Duskywing, and the trees support such species as Eastern Pine Elfin and Sleepy Duskywing.

Traversing these barrens is relatively easy because of the open and sparse vegetation on rather level topography. I've never encountered poison ivy or much annoyance from mosquitoes, chiggers, or biting flies (except as noted below). But beware the abundant ticks! They come in two versions: small (wood ticks) and smaller (deer ticks). The latter have high infection rates of Lyme disease; both kinds offer other tick-borne illnesses too. The size and color of a skin mole, ticks gradually (and utterly painlessly) bite into your skin to suck blood, especially by lurking in parts of your body you don't even know you have. If you do not arrive well apprised on how to cope with ticks, be sure to consult the Department of Natural Resources (DNR) ranger station on Highway 54 just west of the interstate (toward Black River Falls) for informational brochures.

These butterfly accounts derive from the barrens research my husband Scott Swengel and I have conducted here between April 13 and September 6 since 1987. Our surveys, analyses, and papers have especially focused on Frosted Elfin, 'Karner' Melissa Blue, and Phlox Moth. But in our research, we've tried to cover adequately the other barrens specialties of this area, plus I've added more summary information here on some other species not particular to barrens but notable to visiting butterfliers nonetheless. So the butterfly abundances and flight

periods I discuss are not idealized, but very much reflect what it's like when you can't be here every day and can't pick your weather in this place of wild climatic variation. Bright sunny heat in mid-May can resemble a desert summer day, or it may frost in late June. Dangerous thunderstorms, including tornadoes, are a distinct possibility. Remember that a vehicle furnishes shelter from lightning but danger during a tornado. For the latter, seek a basement or interior of a reinforced building.

Since this article is restricted to barrens habitat, it does not reflect the species' overall abundance, or even all the noteworthy species present, in the county. Minor changes in topography lead to major changes in vegetation, from large patches of mesic to wet deciduous forest to the most poorly drained areas, with extensive sedge wetlands, noteworthy for their associated skippers, and peatlands (sphagnum bogs), home to Bog Coppers and Jutta Arctics. Although not the subject of this article, I provide brief information on these two types of wetlands.

Jackson County Barrens Sites

Interstate (I-94) access to this area is at two exits. From exit 116 (Highway 54 at Black River Falls), go east on Highway 54 (away from Black River Falls) about 0.5 miles, and turn east (right) on Bauer Road. From exit 128 (Highway O at Millston), go northeast (away from Millston) 0.2 miles, then take the first left onto North Settlement Road. Dike 17, Stanton Creek Road, and Wildcat Road (Southeast part) are in Black River State Forest; the remainder are Jackson County Forest sites except as noted.

The **Bauer-Brockway Barrens** is a large area divided into several subsites. Be careful not to get disoriented or lost, as most of the site is trackless. All of these burned in spring 1977, and even if you're not into plants, it's a delight to botanize here. About every barrens butterfly you might want to find in the region occurs here, and Common Ringlet (new in our surveys in this region) is increasing here. **Brockway**: Go 0.2 miles south on Brockway Road from the junction with Bauer Road (opposite the entrance to Wazee County Park), on the west side of the road (no established trails). Stay within a quarter mile of Brockway Road to keep off private land. **South Brockway**: Go 0.5 miles south on Brockway Road from Bauer Road, and after you cross the creek, park and then walk in along the sandy service road to the west. Stay within a quarter mile of Brockway Road to keep off private land. **West Bauer**: This area is 0.75 to 1.0 miles west of Brockway Road, on the south side of Bauer. You may follow the trace of an old dirt track (at the 1.0 mile distance) but it's also interesting to walk off-trail. Not marked on the map but also of note in this complex is the **Bauer cut**: This is DNR property between Brockway and West Bauer sites. Be sure to be more than 0.5 miles west of Brockway Road and do not go more than 0.25 miles south of Bauer Road, in order to avoid trespassing on private property. Most of this parcel is relatively uncanopied, as the Christmas trees formerly growing there were all cut down. But a sliver of barrens occurs on the south end of this 0.25 x 0.25 mile tract that had not been planted to Christmas trees. **North Bauer** is public land for the entire mile of frontage west from Brockway Road on the north side of Bauer Road, but relatively little lupine is there so we've spent little time there.

North Brockway: Go 0.9 miles north of Bauer Road on Brockway Road. Just past a culvert under the road, park near a dirt service road to the east. Walk in 0.1 miles on this service road to an opening surrounded by forest. This area burned in a small wildfire in the late 1980s. Not quite as outstanding as Bauer-Brockway Barrens, this site is still very interesting for elfins, 'Karner' Melissa Blue, and Gorgone Checkerspot.

West Castle Mound: Park off the road at the base of the hill, 1 mile west of Brockway Road. To get to the **savanna ("site A" on the map)**, walk south down the disused dirt road 0.1 miles, then meander slightly off this road to the east (left) on a slight mound with dense lupine. Don't lose your bearings! Look for the hill to the west; that will get you back to the track. To get to the **oak forest opening ("site B")**, continue south on the track another 0.1 miles until you meet up with a sandy, well-used ATV trail (beware of traffic). Turn right (west) and go about 0.2 miles up the hill. The ATV trail reaches West Castle Mound Road again, and you can loop back to your vehicle. Site A burned in spring 1977; site B did not. Both sites have considerably forested over since we started surveying here.

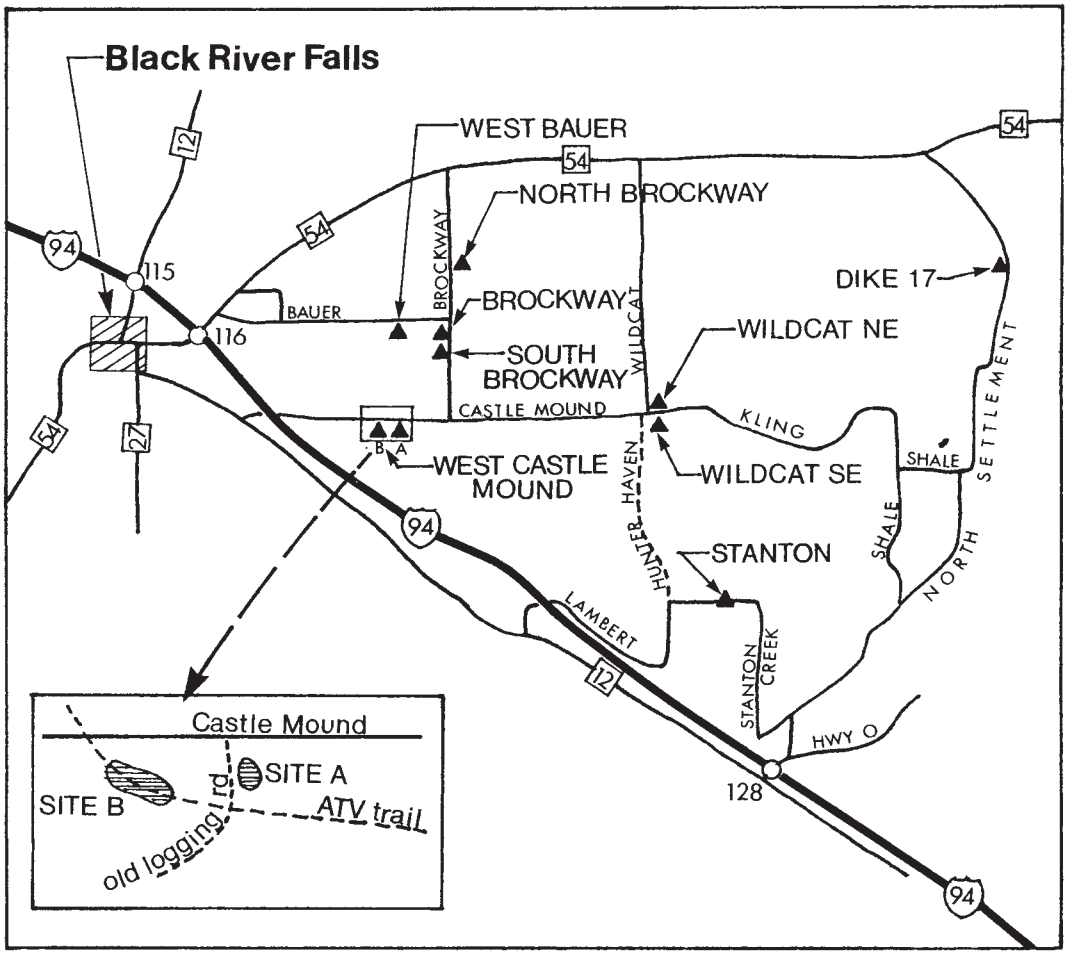
Wildcat Road: At the junction of East Castle Mound and Wildcat roads, also called Spangler-Wildcat and Wildcat-Spangler roads, go either to the **Northeast** quadrant or the **Southeast** quadrant, and watch for openings (no established trails). Beware nasty biting flies in summer. Northeast shows signs of past logging; southeast had signs of beaver. Both sites have considerably forested over since we started surveying here, plus the barrens vegetation in the Northeast ditch has deteriorated. The **Northwest** quadrant has a roadside of barrens but at the south end (at Castle Mound Road), also some sedgy wetland.

Dike 17: From Highway 54, go 2 miles south on North Settlement Road, or from County Highway O at Millston, wind mostly north on North Settlement Road about 8 miles, then turn off to the west into the parking lot. A short trail leads to a wildlife viewing tower. The barrens habitat is on the slightly raised sandy mounds by the parking lot and beneath the tower (no established trails). These areas are retired from burning management that used to occur every three years. The wide open lupine patches are great for 'Karner' Melissa Blues, and this is our best spot for Common Ringlet.

Stanton Creek Road: The area of most interest is about 0.25 to 0.5 miles east of Lambert Road (called Hunter Haven Road to the north of that junction), or about 3 miles from North Settlement Road (and about 0.5 miles west from where the road turns from northward to westward). This roadside is periodically mowed and graded; it can look rather disturbed. Hunter Haven Road may be questionable for passage by passenger cars. Roadside and offroad site disturbance has dramatically increased here, but this remains our best site for immigrants in this area.

Map scale: It is 1.5 miles on Brockway Road between Bauer and Castle Mound roads.

Richard Hildreth



Jackson County Barrens Sites. This map is reprinted with the kind permission of the North American Butterfly Association. It first appeared in the 1998 issue of *American Butterflies*, in the article: "Definitive Destination: Pine-Oak Barrens in Central Jackson County, Wisconsin."

Additional sites not on the map

South Brockway ATV trail: From Castle Mound Road, go a scant 1.0 miles south on Brockway Road to the well-used ATV trail crossing (watch for vehicles). Park away from the ATV trail, which can be treacherous for passenger cars. Walk east along the north side of this trail and north into openings in the bordering forest, which has excellent lupine patches for the first 0.5 to 0.75 miles. **South Brockway motorcycle trail**: This site is just north of the ATV trail site. This disused trail starts just north of where the ATV trail crosses Brockway Road. About 0.2 miles in, watch for lupine patches on both sides of this path. Be careful not to get lost. Both of these sites are less diverse in their butterfly offerings; the prime interest is the lupine.

Highway 54 bog: From the junction of North Settlement Road and Highway 54, go east 2 miles. At the lowest point of the highway, park carefully off the road. To the south lies a peatland (bog)—a nice change of pace—which has peatland butterflies and sedge-associated wetland skippers.

Finding Frosted Elfins

State-listed as threatened, Frosted Elfin is an unobtrusive brown butterfly about the size of a nickel. Even I, as fanatical about Frosted Elfins as anyone could be, must admit that it's not flashy. Besides that, Frosted Elfin is also challenging to find since it occurs at relatively low densities. But I find great beauty in its unobtrusive persistence in a niche and lifestyle I didn't even conceive of until I started trying to see barrens from the perspective of Frosted Elfins. As a result of this ongoing journey of discovery, I now pass just about any concept of barrens and conservation biology through the "Frosted Elfin test." If I don't see how Frosted Elfin data fit it, then the score is Frosted Elfin 1, concept 0.

Location, location, location: Reliable Frosted Elfin spots in Wisconsin share these key characteristics. First, wild lupine (*Lupinus perennis*), the caterpillar food plant, must be exceedingly abundant, way more than what most people usually consider it takes to be called "abundant"—many thousands and thousands of lupine stems. I describe what I'm looking for as a "profligacy

of lupine." Second, the lupine mostly needs to grow in semi-shade (a savanna or forest edge), so that the lupine does not experience full sun all day. Third, a number of patches in the vicinity also need to support a "profligacy of lupine," so that the site has a context of other patches of abundant lupines and presence of Frosted Elfins within 1-2 miles. Fourth, the site needs to have unintensive land use and management. Suitable types include mowing no more often than once a year (especially if it's in late summer or fall) or brush-cutting. If the site was burned in a wildfire, this needs to be more than 5 years ago, and in a context of occupied Frosted Elfin sites nearby that burned much longer ago, if at all. Scott and I have never found a Frosted Elfin in a site currently managed with rotational burning (e.g., 2-5 year rotation), but we have found a few in formerly fire-managed areas (>4-6 years since last fire). On the other hand, absolutely no management or activity at all for decades can also lead to decline of lupine, due to increased brush and tree shading. Finally, the species has been recorded only in six counties in the central part of the state (Adams, Eau Claire, Jackson, Juneau, Monroe, and Wood counties). We've looked extensively in Burnett County at prime sites, to no avail to date. So far, we've not observed or learned of any evidence that Frosted Elfins in Wisconsin use wild indigo (*Baptisia*), as in other parts of the species' range. High densities (elsewhere) may be associated with wild indigo because it is a larger plant with more volume of flowering parts.

Timing, timing, timing: Peak adult timing occurs right before or at the start of lupine flowering (usually around May 20 in central Wisconsin). 'Karner' Melissa Blues will probably not be flying yet in Frosted Elfin sites, which are not seasonally "fast" Karner sites because they have partial shade. But in the same county the very first Karner individuals may be flying in lupine sites that are in full sun, and so are more advanced in seasonal development. It's our sense that the other elfin species may start their adult flight period and peak slightly earlier than Frosted Elfin. The only elfin we've recorded later in central Wisconsin than our latest Frosted Elfin date is Eastern Pine Elfin. In years of low Frosted Elfin abundance, we may find only a very few individuals (10-15) the entire flight period, and only on a few dates. It seems as if there have been more low-abundance years lately, which may be the development of a worrying downward trend. Regardless of year, May 20 has, so far, turned out to be a very safe date to target. Even with the great variation among years in seasonal development here, due to our extreme continental climate, that date has been a safe bet in all our years, whether near the end of a very early flight in 1998 or near the beginning of those extremely slow springs of 1996-97. Over the last 20 years, our mean and median date when we recorded the most Frosted Elfin individuals in central Wisconsin has been May 19 (range May 2 to June 4), and the number of days in the flight period we observed each year averaged 23 days (range 1 to 38 days). Our earliest date ever was April 26 (2000) and latest ever was June 14 (1995).

Other tips: First of all, it helps to be philosophical. Although occasionally we've experienced high densities of Frosteds (multiple individuals consistently in view at once as we walk through the site), usually the species apparently occurs in rather low densities, perhaps due to its specialized food requirement as a caterpillar—it is thought to feed primarily on lupine flower parts, as well as small young leaves. Once narrowed down to that, a "profligacy of lupine" doesn't seem nearly so abundant after all. So, Scott and I go to lots of sites on a field day. We do not belabor a single site by going around in circles repeating the same great lupine patches again and again. Instead, we visit as many different sites as possible. Normally we only see zero to a few individuals on a given day when we're surveying in the right timing and locations with favorable weather, and that's when we're going to as many sites as possible all day (about 8-10 walking miles of surveying). Another value to visiting as many sites as possible: even though all consistent Frosted Elfin sites we know of have partial shade, there still seems to be some variation in seasonal development among these sites, with some sites "faster" (e.g., Brockway) and other "slower" (e.g., West Bauer).

Be sure to look pretty close in front of you and to your sides. Frosted Elfins can be remarkably sedentary, and may flush only just as you walk past them. While they may fly out in front of you, it's also quite possible that they'll instead fly away to your side, or even behind you. They may also not flush very far away, but instead stay low over the vegetation and drop back onto the vegetation rather quickly. Sometimes they don't flush at all, even if you pass close by. They may instead stay still or drop down deeper into the plant. So watch for Frosted Elfins perched on lupine, and focus your attention more on lupine than anywhere else. If I think I've flushed a Frosted Elfin, I freeze and wait to see if it will land or come back. Other elfin species are more rapid and more inclined to disappear. Frosted Elfins may not come back to a spot near where they flushed, or may not land soon, but they are more likely to return, or perch quickly, than the other elfins.

Watch for Frosted Elfins maintaining a territory in an "arena" (a sunny opening with lots of lupine about 3-10 yards in diameter, surrounded by brush and trees). They may be active, but they usually stay in the same arena. Most flights will be horizontal and low over the vegetation. Only the most intense interactions turn into vertical flights. If the elfin is flying, it can be a good strategy to remain stationary and wait, watching the arena for the elfin to return. This is especially a good strategy if you flush a possible Frosted Elfin and lose sight of it. You may have a better chance of seeing it again by freezing (so as not to disturb it more) and waiting for it to return and settle, than trying to chase after it when you aren't sure where it is (so that you might disturb it again). The strategy of freezing isn't perfect. We have occasionally watched Frosted Elfins change arena, flying through shade to do so. We have also seen Frosted Elfins fly a good distance straight-line, seeming not to have a "territory." So the elfin may not return to the arena it started in. Ideally, remain stationary but try not to lose sight of the elfin. By staying still, you won't disturb it more and it may settle back in the same arena quicker; if it seems to be leaving the arena, at least you'll see that

too and where to track it to next. If it doesn't come back, then it's a very good idea to check in the neighboring arena or two in the direction you saw it fly.

Good spots: The best sites are these (with the year we last saw Frosted Elfin in parentheses, 2008 being the most recent possible): Brockway (2008), South Brockway (2008), West Bauer (2008), Bauer cut (2004) (only the south end but don't go too far or you will trespass), North Brockway (2008), South Brockway ATV trail (2008), and South Brockway motorcycle trail (2008). Dike 17 (1996) has always been intermittent in our experience (more likely in/along forest edge than out in uncanopied lupine, but there's not that much lupine in sufficiently shaded spots). Frosted Elfins used to be more regular at the following sites, but we haven't found them for some years (despite annual searches). Canopy has increased at West Castle site A (2001), West Castle site B (2000), Wildcat Northeast (1998), and Wildcat Southeast (1998), while roadside and offroad site disturbances have dramatically increased at Stanton Creek Road (1995).

The other elfins: Strongly tied to bearberry, the tiny and strongly flying **Hoary Elfin** is more abundant in northern Wisconsin but is regular in a few sites here (North Brockway East, Bauer-Brockway complex). **Brown Elfin** is also more abundant in bogs up north than in central Wisconsin, and more abundant in bogs than barrens there and here. **Henry's Elfin** is very unpredictable but does occur sporadically in Jackson County barrens. In most years, we found none in any of these sites, but in 2008, we found more than twice as many Henry Elfins in these sites than in all previous years combined. This rapidly flying elfin is also more vertical in its flight behavior than Brown, Hoary, and Frosted Elfins. However, Henry's can also show territorial behavior, and may return to the general area where you flushed it from. Sometimes it seems to be associating with short ericaceous shrubs and gooseberries (*Ribes*), but other times with oaks and other deciduous trees. Best bets: North Brockway, Bauer-Brockway complex. The most widespread elfin in Wisconsin, **Eastern Pine Elfin** is fond of nectar and mud, and also flies readily both in horizontal and vertical directions. It'll be hard to miss this elfin during its main flight period, but Stanton Road is a remarkably good site for this species.

Finding 'Karner' Melissa Blues

Although listed as federally endangered, the 'Karner' Melissa Blue —the "blue snowflake" of Vladimir Nabokov—can be a blizzard here, with remarkable abundance, at least in some years in some sites in Wisconsin. We've observed some trends, both positive and negative, in the last two decades. Many sites are becoming more forested, which is unfavorable for this butterfly's caterpillar food plant (wild lupine, *Lupinus perennis*) and therefore the Karner too. Forest succession is not surprising or new. But what may be new is seemingly greater difficulty demonstrating the other side of that equation: new populations colonizing recently opened sites. It's too soon to be definitive and maybe this is a longer term fluctuation that will swing up again. However, another category of site favored by Karners (roadside and powerline rights of way) also shows strong declines in our observations, even though these sites are not foresting over and routine management there can be compatible with Karners. Unfortunately, one-shot drastic events (roadside reconstruction, forestry occurring on the adjoining land) and off-road vehicle use are increasing. Both of these scrape the soil bare and reduce lupine, which in turn reduces Karners. On the other hand, some conserved sites managed for natural value have held steady or even shown some small long-term increases.

Location, location, location: Karners have been documented in Wisconsin in a number of central counties as well as a few northwestern ones. It could have also extended, or still occur, in southeastern counties along Lake Michigan, as this butterfly is also known from counties bordering Lake Michigan in Illinois and Indiana. The caterpillar food plant also occurs in northeast and southwest Wisconsin, but Karners have not been documented there. There could be a climatic limitation related to pulling off two generations per year, relative to adequate, unwilted lupine growth available for enough time in both time slots when the caterpillars need it. The lupine may not start soon enough in spring (which may be what excludes northern Wisconsin) and might not last long enough due to hot weather putting the lupine through its cycle of flowering and seeding and wilting back too quickly (possibly excluding southwest Wisconsin). At any rate, the Karner's known range in Wisconsin is climatically consistent in terms of growing season with its range elsewhere.

The all-out highest Karner numbers ever have been recorded in very open sites (lupine patches in wide open grasslands in full sun). But some interesting studies have shown that caterpillar success is relatively greater on partially shaded lupines in forest edges and semi-shaded savannas. Apparently, wide open sunny sites often make up for a somewhat lower caterpillar success by sheer greater volume of lupine per area, thus often generating more Karners per area than semi-shaded sites. As shade increases too much, of course, lupine declines, as it is a sun-loving plant. Climatic variation also plays a part in this equation. Excessive drought can wither wide open sites, while partially shaded sites would be more buffered and then have relatively more Karners. What works best in one brood may not apply to all years or all sites or both broods. Both wide open sites and open savannas have consistently supported large populations, even with these up's and down's and tradeoffs.

Compared to butterflies in general, Karners are localized and exacting in habitat. But compared to other specialized butterfly species, Karners are relatively tolerant of habitat degradation (that is, "disturbance" of the soil surface and the vegetation, with native diversity of flora reduced and non-native diversity (weeds) increased) and land use/management activities (certain kinds of timber cutting, mowing, spot-herbiciding, and burning can be compatible with Karner populations). The critical requirement is consistent abundance of wild lupine. While we have found Karners that

had wandered up to a half mile from lupine, and that were occupying small isolated patches of lupine, all Karners we've seen and know of occurred either in a discrete patch with very abundant lupine or within 1-2 miles of other patches with abundant lupine.

Karner adults feed on a wide variety of nectar flowers, as well as mud, animal droppings, and carcasses. Their feeding appears primarily opportunistic, although they do show a particular preference for certain flowers. But these marked preferences vary from site to site, too. For example, butterfly weed seems to be a particular favorite, but large populations occur in sites without this and other particular favorites such as leadplant, showy goldenrod, and brambles (*Rubus*). So, even these favorites appear opportunistic, too, as it's hard to detect how Karners are adversely affected in their absence.

Timing, timing, timing: The books all say this butterfly has two broods, but I suspect the possibility of a partial third in some years. Otherwise, I find it hard to explain the relatively fresh individuals we've occasionally found in early September, such as a male on September 6, 1994, when our first summer brood individuals in the same county that year occurred on July 8. On the other hand, we find no evidence for a partial third in some other years. In 2007 (a very dry summer), we had main second flight on July 13, only a single individual in the second half of August, and none on September 3. Again, the Karner veers toward vast variation due to a vexing vat of variables, such as how long the growing season lasts and how favorable those conditions are.

The first brood is more sharply timed, while the second (or second and partial third) is more protracted. Both timing and abundance varies extraordinarily among years, even in the relationship of timing and abundance of the two broods to each other. Climatic variation both among years and even between months (i.e., warmer than average in May but cooler in June and July) appears to be a critical factor in this. The summer brood is on average a bit larger than the spring, but the highest abundances we ever recorded were in spring 1998.

Timing of the spring brood varies 2-5 weeks among years, and the summer brood up to 6 weeks, with about 46-50 days between the two broods usually. In two years, we think it's possible that we saw first and second brood individuals on the same day (based on very worn and very fresh individuals), on July 11, 1997 (a very slow year), and on June 22, 1998 (a very warm one). Our earliest and latest dates in the first brood are May 13 to July 11 (or June 26 if discounting our attribution of July 11, 1997), and for the second brood: June 22 (or July 1 if dropping our report from June 22, 1998) to September 6. Approximate peak dates varied from May 29 to June 12 for spring and July 12 to August 5 for summer. In most years, reliable scheduling to find adults is the first week of June and fourth week of July.

Other tips: The trick to finding Karners is to be in the right place at the right time. Once you've done that, the Karners themselves are relatively easy to find, track, and identify. Karners can be relatively tolerant of cloudy, even drizzly weather. We've also spotted a fair number of roosting individuals in or on the grassy vegetation, especially when we're searching for Phlox Moths early in the morning or in cool weather. Higher observed numbers do associate with higher temperatures though. Weather and time of day affect their behaviors, with Karners flushing more (that is, being more sedentary until we come along) when it's cooler and early and late in the day, flying more when it's warmer, sunnier, and at mid-day, and feeding more when it's warmer and from mid-day into the afternoon. They also do more feeding in summer than spring, perhaps due to dehydration from the heat.

Because Karners are readily sexed and observed at length, they offer an interesting glimpse into butterfly gender issues. For one thing, observed sex ratio (percent males of sexed individuals) is higher not just at the start of the brood (as is typical with butterflies) but also at peak numbers (which is mid-brood in timing). This indicates a "density-dependent" behavior—although more females are out of their chrysalises mid-brood than earlier, they adopt a lower profile and become less detectable at the highest Karner densities (which really means higher male densities). Conversely, percent males is higher in spring than summer (even though numbers are typically higher in summer than spring). I wonder if increased female feeding in summer also increases their detectability, and so lowers observed percent males. Males show more density dependence in their behaviors—the higher the density of individuals, the relatively more males are observed feeding and flying. That is, males respond to crowds by being more active. Females show much less of this. But both sexes are density-dependent in mating and what we call intraspecific interactions (pursuits, courtship rejections, and so on). Both occur relatively more at higher population densities. In other words, boy blues meet girl blues relatively more in crowds, and as a result, make love and war relatively more too.

Other blues: Many other blues occur in Wisconsin. The **Northern Blue** is most similar to the Karner but their ranges are known to approach each other only in Menominee County. State-listed as endangered, and known in Wisconsin from the northeast part, Northern Blue is much more localized and rare than the Karner. **Greenish Blue** is another northern species that we've observed in Northern Blue habitat but never in Karner sites. The **Eastern Tailed-Blue** is the most common other blue species we've found in Karner sites. It has much less orange on the underside, although sometimes those 2-4 spots can be unusually large. Even so, they never form a full arc of an orange spot-band as on Karners. The next most frequently encountered blue is the **Spring Azure** complex. When in flight, their lighter blue color (than the Karner) is readily apparent, plus they tend to fly up when disturbed, while Karners typically fly low and horizontally. In central Wisconsin, **Silvery Blue** is fairly localized and infrequent in Karner sites, but in northwestern Wisconsin, Silvery Blues abound, with a flight period slightly offset earlier than but still much overlapping the Karner's first brood. We've found the two immigrant blues recorded in Wisconsin in Karner sites as well: **Marine Blue** and **Reakirt's Blue**. When active, they have a frenetic

flight that combines both horizontal and vertical features. If it gets away, it probably wasn't a Karner.

Immatures: Karners are also relatively amenable to searches for their immatures. Their white eggs are distinctive, shaped like a white Tums or a red blood corpuscle: disk-like but depressed in the center. When laid they are adhered to a surface, but may later fall off. They are laid singly on lupines or on nearby vegetation. After the summer generation has laid their eggs, we've found that searches on the dried, dark lupine pods are particularly successful, not necessarily because this is a preferred surface, but because the color contrast makes the egg easier to spot.

Karner caterpillars make distinctive feeding signs that are helpful in calling your attention to a possible location for a caterpillar. In fact, when a lupine is adorned with a sufficient number of these signs, we dub it a "screaming" plant—not for pain, but for how loudly it announces the presence of a Karner nursery. The most characteristic signs by both spring (May) and summer (June-July) caterpillars is the "windowpane," where the caterpillar eats some of the leaf tissue, but not all the way through, leaving behind a thin veil of tissue that eventually turns whitish. Other caterpillars make windowpanes too, but the Karner's is usually elongate with a smooth and subtle, not abrupt, border between the pane and the unaffected surrounding tissue. But Karner caterpillars make other signs too. In our spring surveys, we found them making holes—both pinpricks and a bit larger holes, including paired holes, when the caterpillar bit a hole all the way through both sides of a young leaflet while it was still folded together—as well as nibbling edges and tips of leaflets. We've done less searching for summer caterpillars (too many adult butterflies to find!) and this is complicated by leftover signs from spring. However, windowpanes seem even more dominant in summer, possibly because the other signs are more feasible on younger leaflets.

The caterpillars themselves are well camouflaged in green, flattened a bit (as if lightly stepped on), and with a small black head capsule and a longitudinal light stripe down the side when mature (full size is a whopping 12-15 millimeters long). Ants, with their activity and dark color, are also a good clue, as they often tend Karner caterpillars (as they also tend aphids). Beware, though—while some ants are scaredy-cats, others are very protective of their charges, and will run and even jump at the opportunity to bite you.

Once we also found a possible pupa, a small green capsule being tended by ants in the leaf litter under a screaming plant.

Good spots: Dike 17 is a "fast" (warmer and earlier) site. South Brockway is a good "slower" site. Brockway and North Brockway East are good sites of average seasonal development. West Bauer is also slow, with lower but reliable numbers. Other sites have been declining for some time and now have a long string of few, if any, Karners: Stanton Creek (due to frequent scraping of ditches) and West Castle Mound and Wildcat sites (due to increasing forest cover).

Finding Phlox Moths

Not a butterfly, the Phlox Moth (or Phlox Flower Moth) is also unlike many moths, for it is active during the day. As a result, searches for Phlox Moths are easily incorporated within butterfly searches. As there are way more moth species than butterflies in the Order Lepidoptera, day-active moths like Phlox Moth are a wonderful window for butterfly enthusiasts to glimpse into the immensely diverse and primarily nocturnal world of moths.

Location, location, location: State-listed as endangered in Wisconsin, and listed at some level in many neighboring states too, Phlox Moth is closely tied to its caterpillar food plant, downy phlox (*Phlox pilosa*), and well camouflaged to hide in plain site on phlox flowers. As is usual with localized Lepidoptera, the plant is more easily found in more places than the lep. Like Frosted Elfin with its food plant wild lupine, so also for Phlox Moth with its downy phlox: an individual site is much more likely to have the lep if it has both abundant food plant and also a context of numerous nearby sites with abundant food plant (and the lep) too. The genus *Schinia*, to which Phlox Moth belongs, typically feeds on developing seed capsules or pods of the food plant, sometimes feeding on the flowers first, and overwinters as a pupa. So, like the Frosted Elfin, Phlox Moths also require a "profligacy" of the food plant, as only a small part of the phlox is actually used.

While they have been found perched on other plants, by far most individuals are found on the flower parts of downy phlox, so targeted searches there are much more likely to succeed. When roosting inactively or when in an active mode yet perched, Phlox Moths may be in an unconcealed position up on top of the phlox flower head, or tucked in an obscured location within or underneath the flower head. Should you find one Phlox Moth, remember to look unobtrusively for additional individuals on the same plant. About one-third of individuals we've found occurred in groups of two or more on the same flower head/stem. After all the work of finding the first moth, you might as well go for that bonus individual(s).

Timing, timing, timing: Seasonal timing for Phlox Moth is tied to the seasonal development of downy phlox. We have found phlox moths from May 23 to June 15 (with searches attempted from May 19 through June 26). The moths occurred throughout the primary period of phlox flowering. But individuals found were significantly skewed to what we judged to be "prepeak" (but many in flower) and "peak" (within 2 days of peak flowering date), while few individuals were found when the phlox was mostly in bud (a few flowers open), post peak (both open and wilted flowers), and mostly wilted flowers. Within a given year, the longest spans in which we've recorded the species were 21 days (1999) and 17 (2006). Taking into account the great variation in seasonal development among years, the most reliable time to look, except in very slow, cool springs, is about June 1-5. Interestingly, its phenology appears notably later in Minnesota prairies, where we found them during July 2-8 in the mid-1990s.

No doubt about it, most of the time, it takes searching a lot of phloxes—even hundreds or more—to find the moth. But you can greatly improve your odds by taking account of how weather and time of day affect its

activity. Like butterflies, Phlox Moths bask in sunshine to warm themselves. But unlike butterflies, Phlox Moths are so tiny that it's extraordinarily difficult to track a flying Phlox Moth, so it's all about finding perched, inactive individuals.

Whether a Phlox Moth flushes from its perch strongly relates to weather and time of day. In our experience, except for one individual that flushed at 61 degrees, all others flushed when it was 68 degrees or warmer. Furthermore, regardless of temperature, no flushes occurred before 8:42 a.m. local time (even when it was warmer than 68 degrees). While Phlox Moths are significantly more active when it's warmer, sunnier, and later in the day, many individuals did not flush after these thresholds occurred. We haven't surveyed late enough in the afternoon and evening to define a settling (non-flushing) threshold. Our latest individual, at 5:04 p.m. local time, flushed.

So, while sunny weather in the 50s at any time of day seems ideal (as no individuals would be expected to flush, yet they could be basking), I suspect sunny and 60s (again at any time of day) may be optimal. More individuals may have moved to unconcealed basking positions and are nonetheless quite disinclined to flush. Alternatively, regardless of sky conditions and temperature, search before about 8:40 a.m. local time, again because of their disinclination to flush then, unless a pounding rain has occurred since the last time when the moths could be active (on a previous day). Heavy rain knocks petals off, pushes plants over, and presumably dislodges moths. Good luck finding them in drenched leaf litter. However, light rain before or during searches can be okay. While moths won't move into bask positions, they may remain in unconcealed roost positions. If it's 60s or cooler, it's okay to search (at any time of day) in cloudy conditions, especially if this follows a sunny period, when moths may have adopted unconcealed perches, because they may remain there.

It's less suitable if it's 70s (or warmer) and after about 8:40 AM local time, regardless of sky conditions, because the moths are active. Plus, the warmer it is, the more other insects, such as nectaring grass skippers, will pop the moths. In these circumstances, we joke about finding out what we've missed by viewing a live feed from "skipper cam" (our fanciful concoction of a miniature camera mounted on a skipper's forehead). High wind is also bad news. While the moths do not seem to flush more in high wind, they do move more in high wind, if for no other reason than being dislodged by the wind. However, my voice of experience testifies that it's not hopeless in high heat or even high wind. We've actually found a decent number of moths when it was in the 80s and low 90s, even in 20-30 mph wind -- enough moths to keep on trying. Use your close-focus binoculars to scan flowers, and use all your skills honed on creeping up on flighty butterflies and you could be in the pink.

While I'm game through drizzle, showers, high heat, blasting wind, and at the crack of dawn, I give up when it's cool and cloudy during and right after a downpour.

Other tips: If you have old presbyopic eyes like I do, bring your reading glasses. And with phlox being so short, be prepared for a lot of bending over and crawling.

Good spots: At North Brockway, when you arrive and park, walk south along the road down to the culvert and just beyond. There's a good phlox patch there in the roadside on both sides of the road (beware traffic, including large barreling gravel trucks), as well as off-road to the west (beware getting disoriented and lost once out of sight of the road). South Brockway West is another reliable site, while Bauer cut (at the south end) also has records.

Finding Olympia Marbles

While not rare, the Olympia Marble is both localized to barrens and prairies and delightfully beautiful. Just when the last snows of winter have passed, this pure white butterfly with magnificent green marbling and rose tinge on the underside announces the certain arrival of spring in flurries of white in these barrens. Olympias do serve a very useful function for conservation, too, as an excellent "indicator species" for other barrens butterflies. It's not mere presence of Olympias that does this trick, since Olympias are relatively widespread in barrens. But higher Olympia abundance often correlates with greater presence and abundance of other barrens-specialized butterfly species.

Location, location, location: Widespread in barrens here, Olympias strongly associate with lyre-leaved rock cress (*Arabis lyrata*), their caterpillar food plant. This butterfly occurs in roadsides, forest tracks, and barrens with this plant, which in turn is relatively tolerant of light soil disturbance.

Timing, timing, timing: Easily found while you're looking for elfins, Olympias start their flight period just before the start of elfin flight. Our earliest and latest dates here are April 13 and June 12, but the main flight period typically occurs somewhere from about April 28 to May 27. We've always found this butterfly during May 7-13, no matter the seasonal variation.

Other tips: Olympias are a bit smaller, more pointed in the front wing tips, and purer white than the more common whites, which are actually relatively uncommon in this habitat. Striking as the marbling is on the Olympia's underside, this is not something you will notice in flight, especially since Olympias fly low over the vegetation. In fact, striking as the Olympia's white color is, you might be surprised how easy it is to overlook a single individual basking on the vegetation or flitting past.

Good spots: Olympias are particularly abundant in the Bauer-Brockway complex and reliable at North Brockway and Stanton Creek. I would say the same for Dike 17, except for their extended absence on our surveys there from 2002 to 2006. But Olympias seem to be reliable again there too. The species is still present but in declining numbers at the West Castle Mound sites, hit and miss in the ditch at Wildcat Northeast, and no longer appearing on our surveys at Wildcat Southeast.

Other whites: Three whites with relatively long flight periods are possible. **Cabbage White** is a very common and widespread resident in Wisconsin; we've found them here from May 6 to September 6. Abundant overall in North America, **Checkered White** is a rarely encountered

immigrant (or sporadic resident) in Wisconsin, with a much longer flight period than we've recorded here in Jackson County (July 17 to September 3, only in 2001, 2005, and 2007). A more northern species, **Mustard White** has turned up very sporadically in our central Wisconsin surveys, including two records in these sites: May 13, 1998 (North Brockway), and August 19, 2005 (Brockway). While technically not whites, both **Clouded Sulphur** and **Orange Sulphur** have a leucistic (whitish) female form, which looks a lot like a white. These Sulphurs also have very long flight periods, which we've recorded from April 29 to September 6 in this area. The sulphur most tied to barrens, **Pink-edged Sulphur**, doesn't have a white form. But its caterpillar food plants are in the blueberry family, with Jackson County at the southern end of its range. Although reported as single-brooded, it has a remarkably long flight period -- May 10 to September 6 in our experience here. This length is consistent with the span of May 2 to August 21 reported by Mogens Nielsen in *The Butterflies of Michigan*. However, our more extreme early and late dates are usually represented by one or two individuals. Main flight is very late May or early June to early/mid-August.

Finding Gorgone Checkerspots

About the size and color of a Pearl Crescent, Gorgone Checkerspot can easily be overlooked as just another of the vast abundance of crescents in the landscape. Not officially listed as threatened or endangered, Gorgone seems to be declining statewide and warrants careful monitoring of its conservation status.

Location, location, location: In Wisconsin, Gorgone is more localized than you may expect from the habitat and range descriptions in the field guides. These may be more reflective of the species' occurrence on the Great Plains, which may be climatically more favorable or more abounding in habitat in a less tilled and developed landscape. Here Gorgone favors dry open sites, occurring (in our observations) in drier upland prairies and sandy barrens. Its apparent caterpillar food plants (daisy-like composites such as sunflowers and black-eyed Susans) do not seem limiting, for these plants occur widely. So other factors (as is often the case with butterflies), such as microclimatic conditions tolerated by the immature life stages, may be involved. While any medium-sized orange butterfly can get lost amongst the crescents, some of these other species (such as Silvery Checkerspot) are detected more often than Gorgone, and can even be considered locally common. This suggests that Gorgones aren't just being overlooked among the crescents, but actually are localized in occurrence.

Timing, timing, timing: Gorgone Checkerspot has an explosive spring flight period, with numbers building rapidly (in good years at least) from first observation date to peak date. The species appears only to have a very partial summer flight here most years, so that it is very sporadic and hard to find yet still possible in mid July to early August.

For the first brood, our first observation date has varied from May 11 (2007) to June 3 (2005, a low year) and last date from June 2 (1998 and 2007) to June 15 (2008). Peak dates varied from May 13 (1998) to June 6 (1996, 2002, 2008). Except for 2005, when the very low numbers resulted in a very short observed flight period, and in very cool, seasonally slow springs (1996, 1997, 2008), it's reliable to target searches in most years from about May 15 to May 31. For the coolest, latest springs, aim for the first week of June.

We have recorded a full second brood only once, on July 8, 1994. But in most summers we record very sporadic numbers (usually singletons), suggesting the possibility of only a partial second brood in many years. While it's possible that we're missing the main part of the summer brood (with it occurring between Karner broods, and so between our surveys), in two years when we recorded singletons (on July 19, 2000, and July 17, 2001), we searched in good Gorgone sites the previous week in good weather and found none. Searches after those July dates resulted in sporadic individuals, too. This is evidence that in at least some years a full second brood may not occur. Our earliest and latest dates for these occasional summer individuals are July 8 (1998) and September 3 (2001) with most dates falling between July 13 and July 24, and only four August dates: August 6 (2001), 8 (2000), 19 (1994), and 23 (2008).

Other tips: It takes some practice, but you can winnow down your search among the crescents by watching for the more strongly contrasting black veins vs. orange background on the hindwing above, and the more strongly white vs. brown contrast below (crescents are a more mellow beige/tan tinged with orange). But you'll need a good look at the underside to be confident of your ID. Meanwhile, watch for the remarkable difference in size between males and females, particularly obvious when you encounter a mating pair or males chasing females. Also, don't assume that if a crescent is pursuing it, what's being pursued must be a crescent. Crescents chase after anything that's remotely orange. Gorgones readily nectar, mudpuddle, and feed on animal droppings. We do encounter them on our early morning rounds in search of Phlox Moths, when the Gorgones are still roosting or just barely active.

Good spots: This species abounds in the Bauer-Brockway complex and occurs regularly at North Brockway. While we have sporadically recorded this species at other sites in Jackson County, this species has not turned up on our surveys at any other site here in this decade.

Other crescents/checkerspots: **Pearl Crescent** and **Northern Crescent** both occur here, as Jackson County is in the overlap zone of these two crescents' ranges. These crescents are way more widespread and abundant than Gorgone Checkerspot, and occur throughout barrens as well as other habitats. Even harder than separating Gorgones from crescents is separating these two crescents from each other. Using the basic wing pattern characters in the field guide, with no guarantee that any one individual ID agrees with a genetic or anatomic identification, we find on our surveys that 95% of individuals appear to allocate as Northern Crescents. However, both versions of crescent occur throughout the entire flight

period (May 15 to September 6) we've identified for each crescent. Particularly high crescent counts have occurred on June 2-26 as well as August 19 (2005) and 25 (1999).

The other crescent and checkerspots primarily occur in other habitats, so that you would only encounter them sporadically in barrens but could have more luck in adjacent moister areas such as wetter ditches and wetland/stream margins. More frequently encountered further north in Wisconsin, **Tawny Crescent** is easily overlooked, a needle in the haystack of the Pearl/Northern Crescent complex. But if you're very patient, and lucky, you may find this species in Jackson County, more so if you target moister open meadows than barrens. Mid-June through July to early August would seem to be the time period to try. **Harris' Checkerspot** is also more abundant further north, but is regular at Dike 17 around the wetter margins. Its caterpillar food plant is reported as flat-topped white aster (*Aster umbellatus*). We've observed this butterfly with the spectacular underside from June 2 (2007) to July 5 (1989). But its flight period is primarily between the Karner broods (mid-June and later), and so usually missed by our surveys. **Silvery Checkerspot** has multiple broods, occurring on our surveys from May 22 to August 6. The prime times have been May 28 to June 1 in spring and July 25-27 in summer. While hit and miss, this species has turned up in most of these sites (except Castle Mound savanna and Wildcat Southeast) at one time or another.

Finding Persius Duskywings

One of those confusing spreadwing skippers when seen in the field, the Persius Duskywing is also confusing in butterfly books. In the eastern U.S., including here, this species appears associated only with lupine as caterpillar food, while out west it also uses other legumes. But in Canada, there are reports of association with poplar and willow, which are also widespread in Wisconsin. But Persius is not common here, which suggests that perhaps there is a confusing sister species out there. At any rate, one thing is clear. In Wisconsin, look in lupine patches for Persius Duskywing.

Location, location, location: The third of our lupine-specialized butterflies, Persius Duskywing seems to get lost in the shuffle. This duskywing is more widespread and abundant than Frosted Elfin but seemingly not as widely occurring as 'Karner' Melissa Blue. As with those butterflies, so also with Persius Duskywing: the search begins with the caterpillar food plant, wild lupine (*Lupinus perennis*).

Timing, timing, timing: Among years, our first date has varied from May 2 (2000) to May 23 (1997) and last date from May 26 (1998) to June 26 (1996). The best dates (with the most individuals that year) have varied from May 11 to June 11. Reliable timing in most years is about May 18-28. It is definitely possible to find all three lupine-specialized butterflies in the same day, with Frosted Elfin being the hardest to find. In fact, we have done this in the same location (portion of a site) on the same survey 11 times between May 22 and June 3, plus an outlier late date of June 12 (1997) back in the more canopied area of Bauer.

Other tips: This duskywing is regularly encountered here but easily blends in among the rapid flights of the common duskywings also flying in May. The primary challenge is coping with the abundance of these other duskywings and spotting the Persius amongst them. It helps to look for the ones that are flying low in figure eights near lupines, perhaps as a territorial behavior. But also bring an extra dose of patience.

Identification is definitely a challenge. It helps to be philosophical and willing to admit that some individuals may be "identified" based on appearance but those IDs may not withstand genetic or anatomic verification. As a result, I think of many individuals as identified to the species complex level (Columbine/Wild Indigo/Persius), rather than definitively to species. A clue that we're in the offing is if the four tiny spots at the leading edge of the front wing are well aligned to each other rather than disjointed. Males are easier than females, in that males are more uniformly dark on the front wing above (which helps eliminate the more contrastingly marked Columbine and Wild Indigo Duskywings).

Good spots: This duskywing is regular in the Bauer-Brockway complex. It's consistent but lower in number at Dike 17 and North Brockway East. At Stanton Creek, it has occurred recently but seems to have declined. Low numbers have continued to occur at the Castle Mound sites but it's dwindling at Wildcat (last recorded at Southeast in 2003 but still barely present in Northeast).

Other species: Six other duskywings overlap with Persius in range as well as in time. The three commonest are **Juvenal's**, **Dreamy**, and **Sleepy Duskywings**. We have recorded all of these species earlier than our first Persius (April 23, 13, and 26, respectively) and all of them on our latest Persius date too (June 26). So you'll have to wade through a lot of these more common duskywings in your searches for Persius. While not a rare duskywing overall, **Wild Indigo Duskywing** does not seem to occur often in this area. However, we have recorded it from May 6 to June 14 and from July 23 to August 15, at Brockway, South Brockway West, Dike 17, and Wildcat Northeast. As its name suggests, wild indigo (*Baptisia*) is its primary caterpillar food plant, but many populations have made the switch to the non-native plant, crown vetch. The tiniest of the lot, **Columbine Duskywing** is named for its caterpillar food plant, which lives in other habitats than barrens. However, in your travels here, you might encounter this duskywing "leaking" into barrens from adjoining habitat. While the species has several generations per year, our few encounters here have all occurred in spring (May 18 to June 7). Already scarce when we began our surveys here in the late 1980s, **Mottled Duskywing** has declined even more; we have recorded none in the county since 2002. We found it in this area from May 28 to June 7 and from July 14 to August 3 (more often in spring), in Brockway, North Brockway, Dike 17, and Stanton Creek. Here's hoping the species still occurs somewhere in this area, either at these sites or some other places with its caterpillar food plant, *Ceanothus* shrubs.

Finding Cobweb Skippers

Tiny but distinctive, Cobweb Skipper is a relatively easy ID in Wisconsin, and so a relatively easy entrance into the confusing but interesting world of grass skippers. However, of the specialist grass skippers that are reliable in Jackson County, this one is the most restricted in location.

Location, location, location: As with so many localized skippers, Cobweb Skipper appears to use relatively common native prairie/barrens grasses as caterpillar food. While these grasses are limited in occurrence (due to habitat destruction and degradation), the skippers are much more localized and rare than these grasses. In Wisconsin, Cobweb Skipper appears to favor very dry, sparse turfs in their dry prairie and barrens habitats.

Timing, timing, timing: Among years, our first date has varied from May 2-27 and our last from May 22 to June 11, except in 2000, a very low year when our last date was May 15. Main flight period dates have varied from May 6 (1998) to May 30 (1995), with most falling during May 11-26.

Other tips: Cobweb Skipper avidly nectars at birdsfoot violet. Otherwise, be very alert to spot this tiny skipper that, with its brown color, blends in well with the browns and tans of sand and early spring vegetation. On the other hand, the Cobweb's flight period occurs when few other grass skippers are in flight, which gives you an advantage in the identification department. With practice you can spot this small brown butterfly in flight and track it to a landing, and in this habitat at that time of year, there's only one species a small brown triangular butterfly can be.

Good spots: Very localized in Jackson County, Cobweb Skipper occurs in good numbers in the Bauer-Brockway complex in consistent populations, and in low numbers at North Brockway.

Other grass skippers: At the start of Cobweb Skipper flight, there are no other resident grass skippers in flight in these barrens. Additional skipper species that emerge during Cobweb Skipper flight are quite distinctive. Very dark and much larger, **Dusted Skipper** (see that account) emerges mid-Cobweb-flight. As the Cobweb Skipper flight winds down, more grass skippers begin to put in an appearance. Grayish rather than brownish, **Pepper and Salt Skipper** is not easy to find here, as it is a more northern species and more often occurs in moister habitats. But we have encountered it a few times in these barrens (North Brockway, Stanton Creek) from May 28 to June 6. The remaining grass skippers are orangish. An avid nectarer at downy phlox, wild indigo, orange hawkweed, and lupine, **Indian Skipper** has first appeared in our surveys from May 23 (2000) to June 7 (2001). Main flight dates have occurred from May 26 (1998) to June 14 (2008). Good sites for this species include the Bauer-Brockway complex, North Brockway, and Stanton Creek. A generalized forest and forest edge species, **Hobomok Skipper** has first appeared on our surveys from May 13 (1998) to June 3 (1997, 2005). Tiny and rapid in flight, **Arctic Skipper** can be easily overlooked as a moth. We've recorded it here from May 19 to June 25, but its primary flight occurs during June 1-10. Although we haven't recorded many here, the best site has been Wildcat Southeast. Other fairly good sites have been South Brockway West, North Brockway East, Stanton Creek, West Castle Mound forest opening, and Wildcat Northeast. It's also turned up at Bauer, Brockway, Dike 17, and West Castle Mound savanna. Resembling Cobweb only in size, the darkly colored **Common Roadside-Skipper** has not often occurred on our surveys here. But the species has turned up in the Bauer-Brockway complex, Dike 17, North Brockway, Stanton Creek, and West Castle Mound forest opening. Most of our encounters have been in spring (May 30 to June 11), with sporadic records in summer (July 22, August 4).

Finding Leonard's Skippers

Distinctive in color and pattern, and later in the summer in flight period than many skippers, Leonard's Skipper is a refreshing relief after wading through the confusing welter of midsummer grass skippers, which have become even more confusing due to wing wear by the time Leonard's appears. All the more reason to appreciate a fresh, distinctive skipper like Leonard's when you see it.

Location, location, location: As I keep saying about our barrens-preferring skippers, Leonard's Skipper uses relatively common native prairie/barrens grasses as caterpillar food. While these grasses are limited in occurrence (due to habitat destruction and degradation), the skippers are more localized and rare than these grasses. While definitely a specialist, Leonard's Skipper doesn't seem as picky about habitat as some others of these localized skippers (such as Cobweb Skipper). In Wisconsin, Leonard's Skipper favors dry (upland) prairie and sandy barrens.

Timing, timing, timing: Our first Leonard's date of the year has varied from August 6-15, except for July 28, 1998, and July 30, 2001. Main flight dates usually fall in mid to late August: August 12-27. We've not tried to determine last dates of the year—on all our surveys in early September (September 3-6), we've recorded the species here. In 2004, we only found the species on August 19, and in low numbers, although we tried on several dates earlier in the month (but not later in August-September).

Other tips: In southwestern Wisconsin, Leonard's Skipper intergrades into the 'Pawnee' form (golden-yellow background color to the hindwing, and sometimes the light spot-band is reduced), but in central Wisconsin, we've only seen the 'Leonard's' form (lovely rusty red hindwing below, with distinctive white spot-band in a sideways v-shape like this: >). In Wisconsin, Leonard's Skippers exhibit an inordinate fondness for rough blazing star (*Liatris aspera*) nectar. This flower is an excellent place to look for Leonard's, and also gives you an idea of when to look as well.

Good spots: Leonard's Skipper is abundant in the Bauer-Brockway complex. It's also reliable at Dike 17, North Brockway East, and Stanton Creek. We have not found the species at the West Castle Mound and Wildcat sites in this decade.

Other grass skippers: In northeastern Wisconsin, you need to be mindful of **Common Branded Skipper**, another later summer skipper (although yellowish), but not

here. We've never seen **Sachem** in Jackson County, but this immigrant skipper is a possibility, and is the only skipper with a distinctive white spot-band on the underside (females only) I can think of that could be seen here in Leonard's timing. However, Sachem females have a brownish underside background color, not reddish as on Leonard's. Otherwise, a variety of other grass skippers are a possibility, but they won't have as distinctive a spot-band below, and they'll by and large be pretty faded. Mostly they'll be (or once were, before fading) tan, brown, or dark in hindwing background color, such as **Northern Broken-Dash**, **Dun**, **Tawny-edged**, and **Crossline Skippers**. Alternatively, they may be (or used to be) orangish (not rusty red) in hindwing background color, such as **Delaware Skipper**. You may have trouble identifying them, but at least you will be confident they are not Leonard's Skipper.

Finding Dusted Skippers

A later spring species, Dusted Skipper is another welcome entrant in the distinctive grass skipper derby. They help you get your grass skipper year under way more confidently than if you wait to dive in after the proliferation of confusing tawny and brown summer skippers appear.

Location, location, location: Here I go again. Like the Cobweb Skipper, Dusted Skipper also uses relatively common native prairie/barrens grasses as caterpillar food. These grasses aren't common from the point of view of the landscape as a whole, since they are limited to native patches of vegetation. But the skippers are more localized and rare than these grasses. While definitely a specialist, Dusted Skipper isn't quite as picky about habitat as some of these localized skippers (such as Cobweb Skipper). In Wisconsin, Dusted Skipper favors sparse dry (upland) prairie and sandy barrens.

Timing, timing, timing: Our first date of the year has varied from May 11 (1999) to June 6 (1996), and our last from June 2 (1998, 2007) to June 26 (1996). Main flight dates have varied from May 23 to June 12, with most falling between May 26 and June 6.

Other tips: Dusted Skipper is fond of nectaring at lupine and downy phlox, which are plants of interest already at this time of year, since they are also important caterpillar food plants (see accounts for Frosted Elfin, 'Karner' Melissa Blue, Persius Duskywing, and Phlox Moth).

Good spots: The Bauer-Brockway complex is great, especially South Brockway West. North Brockway is also reliable, and the species has become more reliable at Dike 17 in this decade. Dusted Skipper has also occurred at Stanton Creek (even fairly recently), but not recently at the West Castle Mound and Wildcat sites.

Other grass skippers: Dusted Skipper is a very distinctive dark grass skipper, but two species are close in appearance. About the same size, **Northern Cloudywing** is a spreadwing skipper but can give the appearance of Dusted Skipper, especially with wings completely closed. Although not often found on our surveys here, it overlaps in both space and time with Dusted Skipper. We've recorded Northern Cloudywing from May 22 to June 26, with most individuals from May 26 to June 11. The species has occurred at South Brockway West, Stanton Creek, and West Castle Mound forest opening. Tiny and not often encountered in these sites, **Common Roadside-Skipper** has occurred on our surveys here mostly in spring (May 30 to June 11) but also sporadically in summer (July 22, August 4). Besides these two species, beware confusion from a **duskywing**, when it perches with its wings shut.

Other notable butterflies in these barrens

These species aren't particular specialties of this area or this habitat, but can be enjoyed here, and may be of particular interest to out-of-staters.

American Copper: This butterfly has shown huge variation in numbers. Our first date of the year has fallen between May 2 (2000) and May 30 (1995), except in two years when we found none until summer: July 27 (2000) and July 24 (2004). We found American Copper on our last survey date ever here (September 6, 1994), so I assume the species is possible for at least a bit later than that. Dike 17, especially just southwest and downhill of the parking lot (right before you hit brush and wetland), and Stanton Road are particularly good sites. The species is regular at the Bauer-Brockway complex and North Brockway. The West Castle Mound and Wildcat sites are not good bets.

Edwards' Hairstreak: This butterfly is readily found maintaining territories from perches on shrubby oaks during mid-summer, especially the middle two weeks of July. If something small and brown flies off a bushy oak, it pays to freeze in hope of its return. Our earliest and latest dates are June 22 to September 6. We find it at all the barrens sites included here. Other midsummer brown hairstreaks here include Coral, Banded, and Striped; Acadian is more gray/silver.

Common Ringlet: This butterfly has recently shown up in our surveys here (2004), and has increased since. So far, we've found them from May 29 to June 15. Although not common (yet), good sites are the Bauer-Brockway complex, Dike 17, and Stanton Creek. Lower numbers have occurred at North Brockway, West Castle Mound forest opening (along the ATV trail), and Wildcat Northeast (ditch).

Peatland butterflies

Peatlands (sphagnum bogs) occur in this county. While more bog butterfly species occur farther north in Wisconsin, you can pick up a few here too. All the local observations I report here come from the Highway 54 bog. **Brown Elfin** is more abundant, and its flight period may extend later, in bogs than barrens. If you want to find one and didn't happen upon one in your barrens searches, it's worth a try here. Look in open areas with short shrubs, as the caterpillar food plants are heaths. **Bog Copper** is a tiny silvery treat in midsummer. We've not tried to define the full extent of the flight period, but we've found at least four individuals on both our earliest date of the season (July 5, in 1989) and latest (July 31, in 1996). Look in more open areas where cranberry abounds. We've never recorded **Bog Fritillary** in Jackson County, but its range extends generally as far south as this area, so it's worth watching for this butterfly too. Based on its flight period

in northern Wisconsin, early to mid-June would seem to be appropriate timing. A large and distinctive butterfly with a floppy flight, **Jutta Arctic** prefers spruce groves and open forests of the bog instead of areas with fewer trees. In only relatively few and cursory visits over a number of years, we've recorded a flight span of almost a month, from May 18 (in 2007) to June 15 (in 2008), with most observations between May 23 and June 6.

Wetland skippers

Since the wetland skippers of Jackson County deserve as much interest and surveying as the barrens, a detailed account awaits another person's efforts. But even in passing, with the skippers "leaking" upland into the edges of barrens and us "leaking" down into the edges of their habitat, we've realized we've seen the tip of a very diverse and intriguing iceberg of butterfly interest. The barrens at Dike 17 emerge out of neighboring lowlands and impoundments. You don't need to jump into the water to find interesting wetland butterflies there. Watch nectar flowers around the shorelines and wetland edges. At Bauer-Brockway, examine the creek corridor that runs through it (between the South Brockway West area and the Brockway area). At Wildcat, go to the roadsides on either side of Castle Mound Road, west of the junction with Wildcat Road. As you travel among these barrens sites, watch for flowery lowland ditches where it's safe for you to pull off. I'll proceed in seasonal order. We've found **Least Skipper** from June 2 to August 27. **Long Dash** comes next, in our experience from June 25 (and I expect that date should be earlier) to July 22. Kicking off the mid-summer bustle is **Dion Skipper** (July 1 to August 1, but primarily July 13-24), which is regular at Wildcat Northwest and Dike 17. Next, but not frequently encountered, are **Two-Spotted Skipper** (July 5-17) and **Broad-winged Skipper** (July 8 to August 12, but primarily July 8-26). **Dun Skipper** (July 9-August 19) first appears a bit late in this seasonal sequence, but it more than makes up for that with abundance. Rounding out the list are **Black Dash** (July 13-24) and the very rarely encountered (here by us) **Mulberry Wing** (July 13-21).

Editor's Note: Photographs will be added to this article in the future. You can find images of the butterflies described in this article in *Butterflies through Binoculars: the East* by Jeffrey Glassberg and other field guides.

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