



*G'nun**

The newsletter of the Washington Butterfly Association

P.O. Box 31317 Seattle WA 98103
<http://wabutterflyassoc.org>

*G'nun is the official greeting of WBA. It is derived from the name of common Washington butterfly food plants, of the genus *Eriogonum*.

The James family at Bean Creek Basin, potentially one of our Annual Conference hikes. (D. James)



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Upcoming Programs

March 6, Yakima Arboretum, Native Plant Society: David James on Moxee Bog and the Silver-bordered Fritillary

March 15, Spokane: Ann Potter on Treasure Hunting: Five Eastern Washington Butterfly Species of Conservation Concern, and what we are doing to track them. With Jon Pelham on video on Basic Butterfly Biology

April 5, Seattle: Jon Pelham

April 16, Spokane: Brook Swanson on Beetle Defenses

May 3, Seattle: David James on Butterfly Boom or Bust: The Ecology of Irruptions

May 17, Spokane: David Jennings on Humble Bumblebees

July 14-17, Ellensburg: Annual Conference

2017 Annual Conference

The Washington Butterfly Association announces its annual conference for the 2017 season! We will be meeting at the Swauk-Teanaway Grange Hall near Cle Elum, Washington, starting the evening of Friday, July 14, when David Nunnallee will provide an introduction to the impressive diversity of butterfly species we may encounter on our field trips in the central Cascades. David James, professor of Entomology at WSU, will provide our keynote address on butterfly conservation issues in Washington on Saturday night, after our group members have enjoyed any of several field trip options in the lush mountains and canyons in the vicinities of Ellensburg and Cle Elum. You may expect to find a variety of blues, checkerspots, coppers and fritillaries, as well as some of the more familiar whites, sulphurs and swallowtails. Lodging will be available at the Ellensburg Super 8 Motel and the Ellensburg Econo-Lodge. There are many other lodging options. Campsites may be reserved at several Forest Service campgrounds along Highway 903, past Roslyn, or at Taneum Campground or Mineral Springs Campground. WBA hopes that this conveniently central and perhaps familiar location will draw enthusiastic participation from around our region! Please see our upcoming newsletter special conference edition for further details.

Bean Creek Basin (D. James)



Young Naturalist Scholarships

The Washington Butterfly Association announces the 2017 WBA Scholarship for Young Naturalists, ages 10-17, for three kids who have the motivation and interest to study butterflies a bit. These scholarships are generously funded by the estate of our beloved Idie Ulsh, founder of WBA. Winners will meet our group of some 40-60 participants at Ellensburg, WA, the weekend of July 14-16 for field trips and lectures with some of the most highly knowledgeable butterfly experts in the state, this year to include Dr. David James and David Nunnallee, authors of *Life Histories of Cascadia Butterflies*. What is unique about this scholarship is that we fund expenses not only for the young people who win, but also a parent or guardian to accompany them. Please encourage your sons, daughters, grandchildren, nieces, nephews, students, scouts, neighbor kids and all others to give us a look and apply! Applications will be accepted from February through April 1, 2017, with winners to be announced in May. Limited to residents of Washington, Oregon and Idaho. Download scholarship application from:

<https://wabutterflyassoc.org/wp-content/uploads/2017/02/WBA-Scholarship-Application2017.doc>

Nature Photo Club for Kids?

Our discomfort with collecting specimens robs some youngsters of the enthusiasm they and their young families would need to join us. So, why not collect with a camera? Most youngsters now have cell phones capable of taking quite good photos. The initial idea was for a butterfly photo club in which youngsters could share photos and experiences. But butterflies comprise a small and seasonal niche. So, maybe better a Nature Photo Club.

A new social media site, Zaaha (see http://zaahah.com/site/page/about_us) is designed specifically for participation by K - 12 students, has good safeguards to maintain safety, and looks like a good platform for setting up a Nature Photo Club for kids. If you have thoughts about this, please share them with Al Wagar

President's Message from John Baumann

Greetings from the snowbound Inland Northwest! It will be a while before I begin to see any Lepidoptera in my snow-covered Spokane butterfly garden. We take heart in the fact that this was not the case across the state in January. In Issaquah, our friend, Darcie Curley, had a Red Admiral land on her knee and even remain long enough for a photo on January 21st! This fascinating record has grabbed the attention of our local lepidopterist community, and may even be included in Bob Pyle's new field guide. Congratulations to Darcie, for helping us celebrate citizen science! David James tells us that the "Admirable", *Vanessa atalanta*, seems to have recently developed a hardiness to overwinter in the adult stage of its life cycle, a phenomenon observed previously in Britain, but never so clearly here in Washington.

Please stay tuned: there will be a number of exciting developments coming to WBA in the coming season. Regarding citizen science, we expect to offer assistance to Ann Potter and the Washington Department of Fish and Wildlife by tracking populations of five different scarce butterfly species, ranging from the Monarch to the Silver-bordered Fritillary to the Yuma Skipper. We expect soon to announce a training weekend for this important volunteer work. It will be offered free of charge in early May in the Spokane area, and will consist of one day of class time followed by field experience the next. Weather permitting, we'll head out with our newfound skills for Juniper Dunes to search for the Juniper Hairstreak.



The Issaquah Admiral, 1/21/17. (D. Curley)

We will also be looking to survey species at several Department of Natural Resources sites where butterfly populations have yet to be monitored. WBA members and friends may join board member Melanie Weiss on her weekly surveys of the Naches Loop Trail to inventory butterflies and plant phenology for the National Park Service. Please see our website for details or find her contact info at the end of this newsletter. Dr. David James will be working with Yakima area conservation groups on restoring Moxee Bog as a habitat for the Silver Bordered Fritillary. And as a helpful conservation reminder for all pollinators, Spokane area volunteers will be invited to assist in developing a butterfly garden in the Manito Park area of Spokane. Last but not least, please check out our website for several upcoming convenient enhancements and additions, including capacity to renew your membership online.

We look forward to starting up field trips again with perhaps some early scabland visits to locations like Schnebly Coulee, near Vantage, or Fishtrap Lake in Lincoln County. Others will be scheduled for some of your favorite locations. If you are interested in leading a trip yourself at any point in the season, please get in touch with us through contact information in this newsletter or at our website!

Members in our remote locations who tuned in to the webcast of David Jennings' presentation on bumblebees this week can be assured that we will continue developing our webcasting services, and will be offering more webcasts in the future. We apologize that the fine photography and diagrams that David had intended to show were not visible in the webcast, but this material will be available online at our website. The technical challenges attending that broadcast will be resolved.

Here's hoping for warming weather with the lengthening days, and the optimal balance of spring sun and rain for a terrific flight of Northwest butterflies in 2017. Good hunting!

Five Eastern WA Butterflies In Need of Monitoring By Wendy Connally and Regina Johnson

Washington's State Wildlife Action Plan (SWAP) is a comprehensive plan for conserving the state's fish and wildlife and the natural habitats on which they depend. It is part of a nationwide effort by all 50 states and 5 U.S. territories to develop conservation action plans and participate in the State and Tribal Wildlife Grants (SWG) Program. The SWG Program supports state actions that broadly benefit wildlife and habitats, but particularly "Species of Greatest Conservation Need (SGCN)" identified by each state.

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The SGCN list starts with species already state-listed as threatened, endangered or sensitive, then adds other species which need conservation attention. The plan identifies known threats and information gaps, then outlines conservation actions for SGCN and the habitats on which they depend. The idea is to protect and recover rare species while keeping common species common, preventing the need to list where possible. Data collected under this plan will inform future updates of the Species of Concern and Priority Habitats and Species lists, as well as other conservation planning processes throughout the agency. See <http://wdfw.wa.gov/conservation/cwcs/> for the 2015 Washington State Wildlife Action Plan.

Thirty-three butterfly species are included in the 2015 WA SWAP as [Species of Greatest Conservation Need \(SGCN\)](#). Five of these are proposed to be the focus of a possible new spring-summer citizen science project in eastern Washington, to help fill in information gaps:

- *Boloria bellona toddi* (Meadow Fritillary)
- *Boloria selene atrocostalis* (Silver-bordered Fritillary)
- *Callophrys gryneus* Columbia Basin segregate (Juniper Hairstreak)
- *Danaus plexippus* (Monarch), and
- *Ochlodes yuma* (Yuma skipper)

The Washington Butterfly Association (WBA) has reached out to Washington Department of Fish and Wildlife (WDFW) for support and guidance to conduct surveys meaningful to butterfly conservation. Field efforts east of the Cascades – detection, survey, and mapping – would help natural resources managers better understand the current distribution, habitat associations, threats, life history and status of these five butterfly SGCN. That knowledge and well-collected data could inform future surveys, monitoring, research, habitat restoration, outreach and other conservation actions.

WDFW and WBA are working together to develop a potential field project and determine how we can best:

- add reliable vetted butterfly observations to WDFW's data for these five SGCN;
- provide information on occupancy of accessible historic locales;
- collect information on butterfly SGCN life history and habitat association;
- develop butterfly identification and survey skills specific to the five SGCN;
- broaden public awareness of butterfly conservation needs in eastern Washington; and,
- support a positive public wildlife-watching experience with prompt feedback to the project participants.

This work (or a portion of it) could potentially continue in subsequent years to build better long-term data sets and conservation understanding. Observations collected through this project would be available to a number of conservation partners: WDFW, Washington Butterfly Association, Xerces Society, The Lepidopterists' Society, and university researchers, to name a few.

WBA would be asked to engage and recruit qualified members and coordinate with participants; to provide volunteer management, data review and quality assurance prior to review with WDFW; and to collaborate with WDFW on an end-of-season workshop and participant feedback.

WDFW can provide and/or facilitate survey guidance and protocols, training workshop(s), data collection tools for WBA surveyors to use, data review and entry into the WDFW database, a findings summary, an end-of-season workshop for participant feedback, and reporting. The post-season assessment and findings summary will inform whether or how we can continue our work together into the future.

Ideally, the project will create a self-sustaining framework for WBA to focus on these species for several years, a communication pathway between WDFW and WBA for shared priorities, and better data to inform butterfly conservation action.

Watching Washington Butterflies with Bob Pyle

Number Twenty-eight

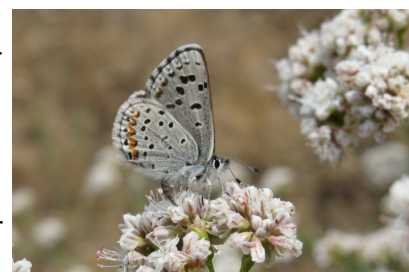
Butterflies (and Butterflies!) as Botanists



Red Admiral caterpillar on nettle. (M. Weiss)

One of our great mentors at the University of Washington in the late 'sixties was the great botanist Arthur R. Kruckeberg. Much later the author of durable books including *The Natural History of Puget Sound Country*, *Gardening with Native Plants*, and *Geology and Plant Life*, we knew him in those early days as a master teacher and the faculty advisor for our campus conservation club. He was also splendid afield, where he was often found together with his boon companion and fellow professor Frank Richardson, the mammalogist and ornithologist, each sporting his white goatee and pipe. I'm not sure I would have made it through my undergraduate years without the two of them, and their brave support for a young would-be naturalist in a modern university.

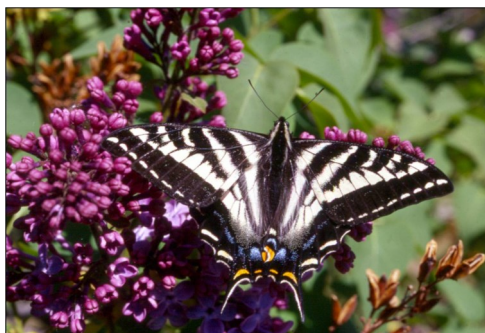
So it was a giant surprise and honor when, decades later, I got to teach alongside Art at the Spring Naturalists' Retreats of the North Cascades Institute. For several years running, we spent five charmed days leading our field classes over roughly parallel trails on Sun Mountain in the Methow Valley. Thea, equally adept with wildflowers and butterflies, danced back and forth between us, assisting both classes. Art and I planned our routes to converge on an old homestead at lunchtime, where picnic tables sat around a meadow beneath an enormous pioneer lilac bush. As the botany students and butterflies broke bread together, Art and I arrayed ourselves on one of the tabletops and launched a volley of give-and-take conversation about plants, insects, and their co-evolution. Each of us had his holy implement beside him: for Art, it was his prized "Daubenmire Stick," a black-and-white graded scaling rod given him by the great botanist Rexford F. Daubenmire of WSU. For me, it was my beloved butterfly net Marsha, crafted of a Colorado cottonwood limb. I imagine we two bearded nature-geezers resembled landlocked Neptunes, with Dauby Stick and Marsha for tridents.



Columbia Blue ovipositing on *Eriogonum*. (M. Weiss)

Often as not, a big female Pale Tiger Swallowtail would alight on the lilac and tank up on sweet nectar, or an Echo Azure would flicker through on its high road into some flowering shrub or tree, and we'd be off with correlation, speculation, and disputation. It was fun for us, and I don't doubt for the students, to see that kind of biological give-and-take. The stories of plant scientists and entomologists collaborating to learn how plants and insects collaborate just flew back and forth. "Didn't Darwin say...", Art would offer; and I'd respond with something from Paul Ehrlich or Lincoln Brower. Art called it our "Alphonse & Gaston" act. "Or is it Abbot & Costello?", I'd quip. But quite apart from any entertainment value our jolly colloquy might have had, or its value in keeping it interesting for ourselves year after year, the point was surely taken home with every participant that you don't get butterflies without plants. As Art liked to say, quoting Goethe, "*Alles ist Blatt!*"—everything is leaf!

Pale Tiger Swallowtail on lilac. (R. Pyle)



Another one of our great teachers at the UW was C. Leo Hitchcock, editor of the monolithic *Flora of the Pacific Northwest*. Thea (who later served as Hitchie's herbarium assistant) and I both had the great good fortune of taking Botany 113 (Local Flora) from him, and to this day I consider it the most valuable class I've ever had, along with typing. For when one is basically acquainted with the families of plants, and a number of representative genera and species, the green world opens up, and the connection between plants and insects becomes not only obvious, but also possible to parse. You can go forth anywhere and, as Anne Zwinger writes in *The Near-sighted Naturalist*, feel a little at home if you "recognize some friends (nice old Mr. Agave, dear Aunt Mustard, and dearest friend, Anenome)." And that can make all the difference to a butterflyer, and to her success in field or garden.

My title "Butterflies as Botanists" is a bit of a jape, since not only butterflies and moths but all herbivorous insects are evolved to know the plants upon which they depend with exquisite and mortal intimacy. Imagine a Monarch that couldn't tell the difference between a milkweed and a milk vetch. It wouldn't leave any offspring, and that's how natural selection works: it rewards reproductive adeptitude. Monarchs and milkweeds have co-evolved for many thousands of years, so they both know what to expect of each other. Plants can cope with the predators they become used to, and those predators do best by specializing on reliable crops—especially if they can derive double-duty from them, such as protective toxins as well as basic nutrition. Hackberry-feeding snout butterflies have been found fossilized with hackberry leaves millions of years old.



Monarch caterpillar eating milkweed. (Matthew Hull)

But the other part—"Butterflies as Botanists"—deserves our close attention. I find few experiences in the field more satisfying than checking out a stand of plants with the hope or expectation that a particular type of butterfly will be there, and lo!, it actually is. I remember the first colony of Hoary Elfin I found in the state, while working on *Watching Washington Butterflies* in 1970. Having known from boyhood in Colorado that the species frequented kinnikinnick or bearberry (*Arctostaphylos uva-ursi*), I pulled over to examine a roadside blanket of this plant near Littlerock in Thurston County. No sooner did I give Marsha a swish over the pink flowers and dark green leaves than an elfin popped up, then another, and several more in quick succession. That was fun! Not *as* much fun, a few years later, was whacking acres of Kinnikinnick at Leadbetter Point to find that every little butterfly responding was a Brown Elfin, quite happy with Bearberry as well as Salal, or else a Pine Elfin from the Shore Pines all around. It doesn't always work; you do have to be where the butterfly actually occurs.

On another occasion, I was seeking Sandia Hairstreaks in New Mexico. This butterfly, though beautiful coppery-green, hefty, and highly distinctive, wasn't even discovered until it turned up in a 4-H collection in 1958! I'd never seen it before, and was hoping to find it for the Butterfly Big Year in 2008. I'd checked patches of the hostplant, *Nolina*, a monocot called Beargrass (but not related to our plant of that name) in the Magdalena Mountains and near Socorro and White Sands, without success. But at the type locality in the Sandia Mountains near Albuquerque, the *Nolina* was abundant and jumping with *Callophrys macfarlandi*. Again it paid off to know the plant and hang around it. Many of us could name dozens of such experiences.



Hoary Elfin on Kinnikinnick. (J. Baumann)

Of course, it's always pleasant and sometimes productive simply to cruise the countryside, looking for what pops up; and frequenting colorful clusters of nectar flowers often gives good results. Clearly, you don't positively *have* to be proficient at plant identification to enjoy butterflies. But in my experience and that of many friends and colleagues, the better your botany, the more butterflies you'll find—especially specialists and rarities. And commoner kinds get commoner yet when you seek them at their "headquarters", as the old lepidopterists put it. Want admirables, angles, and torts? Look for nettles! Fancy some frits? Go for *Violas*! Hoping for Viceroy's, Cloaks, and Sylvan Hairstreaks? Wander among the willows! And of course everyone in WBA knows by now that dotted and spangled blues haunt buckwheats (=G'nums).



Milbert's Tortoiseshell caterpillar on nettle. (M. Weiss)

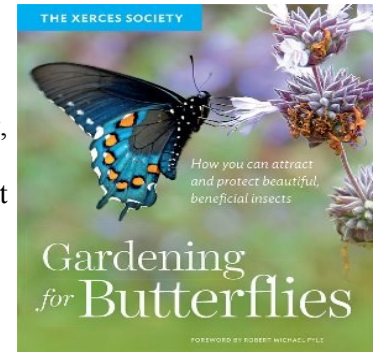
Not that such a strategy is foolproof. Readers of this column will know that I have made myself a frequent fixture of Asotin County Hackberry groves without finding Hackberry Butterflies; but if we ever do, that's where they will be. Nor is this approach limited to wildlands in its application. Obviously, the better butterfly garden will be the botanically sophisticated one. You can take a short cut, and learn along the way, by obtaining, following, and studying the Xerces Society's beautiful and highly useful new book, *Gardening for Butterflies*.

No one will any longer have the good luck that Thea and I enjoyed to learn our plants at the feet of Art Kruckeberg or C. Leo Hitchcock. Their like will not come again. But there are still some excellent field botanists in the teaching ranks, both in the colleges and the summer institutes. There is a lot of help and plant fellowship available in the Washington Native Plant Society, including Study Weekends and ID-intensive field trips where learning comes fast. And if none of this appeals

or is possible for you, there is nothing to keep you from picking up a copy of Pojar & MacKinnon* or any of the other excellent field guides, and having it in the field for yourself. Of course, there are lots and lots of plants out there. Getting to know them all might take a lifetime. But even learning a new flower a week, a new tree every summer, is much better than nothing. Soon you too will be able to say, "Aha! There's my good friend Ocean Spray, and her old pal, Salal!" Watching where the butterflies go and what they do will help you narrow down the most important plants to learn first.

Butterflies as botanists? You bet—and the very best teachers are the butterflies themselves. They *really* know their plants.

*Westside, use Pojar and MacKinnon's *Plants of the Pacific Northwest Coast*. Eastside, use Parish, Coupe and Lloyd's *Plants of Southern Interior British Columbia and the Inland Northwest*. Both from Lone Pine Press.



<http://www.xerces.org/books-butterfly-gardening/>

More Volunteer Opportunities

Join the Center for Natural Lands Management's South Sound Prairie Program in restoring prairies across the South Puget Sound region. We are looking for volunteers who are interested in restoring remnant prairies to provide habitat for rare and endangered species (including the endangered Taylor's Checkerspot Butterfly).

We have many ways for interested individuals to get involved with habitat restoration. Volunteers can get involved with removing invasive species from the prairies, collecting native forb and grass seed for propagation, planting native prairie plants including critical larval food plants for butterflies, or helping out at our farms with native seed production. Each Tuesday, alternate Fridays and the second Saturday of each month volunteers are helping with our projects. If you are interested in helping or learning more about the local prairie ecosystem you can learn more at southsoundprairies.org. Under the Volunteer page you can sign up to receive our weekly volunteer newsletter, which will keep you up to date with our volunteer events.

Winter Party

WBA had it's annual winter party on January 14, 2017 at the beautiful home of Ed and Ann Lipkin. We thank them profusely for hosting this event! The party was marked by great food and great camaraderie among the 23 attendees. As in recent years, the carnivores among us enjoyed the great smoked turkey provided by WBA. Omnivores and herbivores all enjoyed the great selection of other tasty dishes. The number of attendees may have been down slightly from other years because the Seattle Women's March also occurred that day; several people attended the March before the party. Nonetheless, we easily exceeded the critical mass for a tumultuous white elephant exchange, and had more than our usual amount of "stealing" of white elephants. Although some whining was heard, and some people weren't very happy to have their gift taken from them, no one came to physical blows and all had a great time. The special "Richard Lindstrom" butterfly shirt (in its third year as a winter-party gift tradition) made its appearance and will be spending the next year with Carolyn Shelby, a new member from the Olympia area. We missed those who couldn't come and we wish all a happy 2017!



The Richard Lindstrom Butterfly Shirt.
(R. Reisenbichler)

Iridescence

by Karen Anthonisen Finch

Reprinted by permission from *Fluttering Friends*, newsletter of the Sarasota County Butterfly Club, May 2016

In April I attended a lecture at New College of Florida to learn from Professor Natalia Dushkina why butterfly wings, such as the Morpho, have gorgeous, iridescent colors. Did you know that the Morpho can be seen flying 3 to 5 miles away in a forest? I didn't. But I will never forget the time I saw it flying ten feet in front of me in Panama – and the amused reaction of the locals to my outcry “Morpho, Morpho, Morpho!” Just a butterfly, right?

With an audience of about 50 people (amazing, considering it was 4 pm on a Friday) Prof. Dushkina discussed the composition of opals, labradorite (another gorgeous stone), feathers (such as peacocks), and butterfly wings. Scientists discovered that they all contain bio microstructures which interact with light to produce structural colors that are iridescent. Structural colors are non-pigment colors that originate from the scattering of light from microstructures. Pigments absorb light, while structural colors are produced by interaction of light with the structure of the substance. In short, pigments can be extracted from the colored tissues by appropriate chemical reagents, while structural colors are not produced by pigments and are not affected by chemical treatment of the structure creating the color.

At various angles, a peacock's feather or an opal or the wings of the Morpho butterfly appear to change color. The different levels of the layers and their rough composition are keys for light to diffract.

The Morpho butterfly is a perfect example. Simply put, the tops of the scales in its wing have non-uniform heights of parallel ridges. When seen under a scanning electron microscope, the butterfly's wing has an amazing structure that resembles a forest of equidistant stems/ trunks (like pine trees), resting upon a semi-curved ground – actually tubules – all that help scatter light to produce the fascinating Morpho iridescent blue color.



Morpho butterfly wing structure Radislav A. Potyrailo et al <https://commons.wikimedia.org/wiki/>

So what are some other examples of animals with structural colors? Do you know about the Japanese Beetle, the eating machine that is a serious pest of about 200 species of plants? The elytra (forewing) of this beetle are iridescent copper-colored. Another insect is the Emerald Ash Borer, a green jewel beetle native to eastern Asia that feeds on ash species. Scientists were able to develop a female model of the Emerald Ash Borer with realistic elytra using knowledge of structural colors. They mass produced these fake females with an electrical charge released on contact and placed them strategically out in the field, which then attracted male Emerald Ash Borers. As soon as the male landed, ZAP! It was electrocuted.

The knowledge gained from the discovery of bio microstructures led to the development of nacreous* paints, fabrics, and cosmetics. (*Nacreous – from Nacre: mother of pearl, produced by some mollusks as an inner shell or outer coating of pearls. Strong, resilient, and iridescent.) Remember when metallic colors on cars came out in the mid 1990s? The development of those metallic paints was a result of this scientific inquiry!

The next time you admire the shimmering colors of iridescent butterflies – or your car's sparkly paint job – you now know why it is so captivating. All that glitters – or is nacreous – is not gold!

Professor Natalia Dushkina of Millersville University in Pennsylvania is from Bulgaria and speaks several languages fluently. She can be reached at Natalia.Dushkina@millersville.edu

Professor Dushkina is coauthor of the chapter: “Structural colors” Natalia Dushkina and Akhlesh Lakhtakia, In: Lakhtakia, A. & R. J. Martín-Palma (eds.), *Engineered biomimicry*. Elsevier, Waltham, MA (2013), pp. 267–303.

2017 Field Trip Schedule (Subject to Change)

Date	Destination/Description	Difficulty	Trip Leader/Contact
April 22	Cowiche Canyon. A joint Cowiche Canyon Conservancy/ Washington Butterfly Association Earth Day Hike	2	David James
May 6-7	WDFW training session on 'threatened' butterfly species followed by a hike at Juniper Dunes near Pasco to hopefully see the rare Juniper Hairstreak	3	John Baumann, Ann Potter
May 13	Waterworks Canyon. A spectacular flower and butterfly-filled shrub-steppe canyon near Yakima	3	David James and Melanie Weiss
May 20	Snow Mtn Ranch, Yakima. Joint WBA-CCC trip focusing on catching and tagging Coronis Fritillaries for research.	3	David James
May 20	Little Spokane Natural Areas Rutter Canyon		John Baumann and Brenda McCracken
June 3	Umtanum Canyon. Well-known butterfly canyon between Ellensburg and Yakima, up to 4 miles round trip easy hike, \$5 parking fee.	3-4 (creek crossings)	Melanie Weiss
June 3	Dishman Hills Conservancy Illers Creek		John Baumann
June 17	Swakane Canyon. Spectacular butterfly location near Wenatchee		David Nunnallee
July 15-17	Annual Conference, Ellensburg		
August 5	Bethel Ridge. Spectacular views and high elevation butterfly meadows	4	David James
August 12, 19, or 26	Monarch tagging day at Lower Crab Creek (actual date determined by abundance of Monarchs)		David James

Non-consumptive appreciation of butterflies is central to our purpose, basic to our approach, and the guiding principal behind general membership field trips. Collecting of adult butterflies is not allowed on these trips. Collecting of eggs and larval stages for rearing is accepted on condition that individuals raised to adult stage are released at their original location.

HOW TO SIGN UP: Anyone can sign up at a WBA monthly meeting or by contacting the trip leader. (See Board and Committee list in this issue for contact information)

RAIN DATES (if any) SHOWN IN PARENTHESES

DIFFICULTY RATINGS:

- 1 Easy, mostly by car, minor walking along roads
- 2 Fairly limited walking, some slopes involved.
- 3 Moderate, up to 2 miles walking with moderate slopes.
- 4 Difficult, hiking required, trails or terrain are steep in places
- 5 Very difficult, extended hiking on trails or steep terrain.

Field Trip Instructions

WHERE & WHEN TO MEET: Trips depart from the north half of the Ravenna Park & Ride at 7:00 a.m. unless expressly stated otherwise. The park & ride is located under I-5 at Ravenna Blvd between NE 50th & NE 65th St. On request we also stop at the Issaquah Park & Ride at 7:30 a.m. To reach the Issaquah Park & Ride: going eastbound on I-90 take Exit 15 (1st Issaquah exit). At exit stoplight turn right (south) and drive 0.45 mile to Newport Way intersection (traffic light). Turn left (east) on Newport Way and drive 0.1 mile to another light, and turn right (south) into the Park & Ride. If you live in another part of the state, contact the trip leader to arrange where to meet the field trip group. Please tend to personal matters such as getting coffee or lunch food before departure time so others are not delayed. Bring your own beverages, snacks and lunch for a day in the field.

All field trips are conducted by carpool. Without the volunteer participation of drivers, the trips are not possible. If you have a car that you are willing to drive, please have the gas tank full and ready to go.

All WBA-sponsored field trips are fully insured.

COSTS: Passengers are expected to share gasoline expenses. Typically this is \$10-20 each. Each rider should also pay a share of any park entry fees, ferry fares, etc.

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Science Advisor	Jon Pelham	
Membership	Reg Reisenbichler	
Annual Conference	David Jennings	
Field Trips	David James	
Programs	Available	
Publicity/Website	Carolyn Heberlein	
Newsletter	Regina Johnson	
Trip Leader, Central WA	David James	