



Washington Butterfly
Association

G'n^um*

The newsletter of Washington Butterfly Association
Volume 4, Number 1 January—March, 2003

*G'n^um is the official greeting of the Washington Butterfly Association. It is derived from the name of common Washington butterfly food plants, belonging to the genus *Eriogonum*.

UPCOMING WBA ACTIVITIES

WBA has several fun and interesting events planned for the first months of 2003. We hope all of you will be able to join us for one or more of them.

WBA Meeting Programs

WBA meetings are held on the first Wednesday of each month. They are held at the UW Center for Urban Horticulture (3501 NE 41st Street, Seattle) and begin at 7:00 p.m. The first fifteen minutes are used for social reception and viewing of displays.

January 1: New Year's Day—No WBA meeting.

February 5: Rearing and photographing immature stages of butterflies. *Dave Nunnallee*

March 5: Symbiotic relationship between butterflies and ants and the families that use this relationship. *Dr. Merrill Peterson*

April 2: Butterfly Anatomy. *Jonathan Pelham*

May 7: Butterfly Physiology. *Jonathan Pelham*

WBA Holiday Party

January 11, 2003

The second annual WBA Holiday Party is just around the corner. It will take place on the evening of Saturday, January 11, 2003 at Jon Pelham's home in Mountlake Terrace. Like the 2001 party, this will be a potluck—the Board of Directors is supplying a smoked turkey—you decide what you'd like to bring. We're also planning a white elephant gift exchange. If you'd like to join the exchange, bring an inexpensive gift, new or used, serious or silly. The last party was a lot of fun. Reminder postcards should have arrived in WBA members' mailboxes.

"Tropical" Field Trip to Pacific Science Center Butterfly House

February 8, 2003

Join us for a tropical field trip to the Pacific Science Center! WBA is holding its first-ever winter field trip on Saturday, February 8, 2003 from 3:30–7:00 p.m. The Pacific Science

Center is located at Seattle Center, 200 Second Avenue North in Seattle. Those who wish to carpool will meet at the Ravenna Park and Ride lot at 3:00. The Park and Ride is located on N.E. 65th Street under I-5.

Entrance to the Science Center costs \$9.00 for adults, \$6.50 for seniors and juniors. The charge will be lower if we have a group of 15 or more.

Bring your close-focus binoculars and camera if you are interested in practicing your close-up techniques. If you have guide books to neotropical areas or southeast Asia, bring them!

March Field Trip—Schnebley Canyon

The 2003 field trip schedule hasn't been determined yet, except that we will make our fourth annual foray to Schnebley Canyon* in March. The trip to Schnebley has become WBA's traditional season opener. Schnebley is loved for being one of the earliest places in the state each year for butterflies—green hairstreaks start flying there in March. The date of the field trip depends on the weather. More details will be available at the March membership meeting and on the WBA email notice line.

**Schnebley Canyon is outside of Kittitas, Washington.*

WBA Annual Conference

Save the weekend of June 20-22, 2003 for WBA's Fourth Annual Conference. This year's conference will be very special—the headquarters will be in Metalline Falls, in the northeast corner of the state. It's an area with some unique habitats and butterflies that aren't common in the west and central parts of Washington. Watch future issues of *G'nun* for more information.

Federal Protection Sought for Three Northwest Butterflies

In December, 2002, a coalition of conservation organizations, including the Xerces Society, petitioned the U.S. Fish and Wildlife Service to have three butterfly species listed as Endangered under the Endangered Species Act. The species are Taylor's checkerspot, Mardon skipper and island marble.

These species are threatened by the loss of their native grassland habitat from causes such as agricultural and urban development, encroachment of trees, and spread of invasive plants. More than 90% of Puget Sound prairies, grasslands and oak woodlands have been destroyed; only three percent remain in relatively good health. Mace Vaughan, staff entomologist at the Xerces Society says, "If something isn't done soon to protect what remains of its unique grassland habitat, we likely will lose the Taylor's checkerspot in the next couple of years." Pesticide use, recreational activities and grazing pose additional threats to the butterflies.

Scott Hoffman Black, Executive Director of the Xerces Society commented, "Butterflies are important environmental monitors. They are like the canary in the coal mine and show, once again, that these grassland ecosystems, and all of the species that depend on them, are in trouble."

The butterflies all inhabit native prairie in the Puget Sound area. Only four populations of the Taylor's or Whulge checkerspot (*Euphydryas editha taylori*) remain and three contain fewer than fifty individuals, based on surveys conducted in 2002. It formerly occupied extensive grasslands, prairies and oak woodlands in the Puget Sound Basin, on Vancouver Island and in the Willamette Valley.

The island marble (*Euchloe ansonides insulana*) is found in only one place on San Juan Island. It formerly occurred on southern Vancouver Island, the Gulf Islands and other islands in the San Juan group. It had been believed to be extinct since the 1920's, but was rediscovered in 1998 on San Juan Island.

Mardon skippers (*Polites mardon*) occupies a wider area than the other two butterflies. The Mardon once occupied extensive fescue grasslands in Washington, Oregon and northern California, but it has recently been extirpated from four sites in south Puget Sound. Just four small, geographically-isolated populations remain in south Puget Sound, the Cascade Mountains in southern Washington, the Siskiyou Mountains in southern Oregon, and coastal northern California. All of the sites are small, and most of them support fewer than 50 individuals.

Petitions were also filed for the streaked horned lark and eight species of pocket gopher that are associated with grasslands, prairies and oak woodlands of the Puget Sound Basin and Willamette Valley.

The source of information for this article is Xerces Society homepage at www.xerces.org. The site has more information about the butterflies, including photographs.

Confessions of a Beginning Butterflyer

by Tom O'Connell

In early January of 2003 I'm going to be part of an Elderhostel (for us senior types) to Cuba. As usual, when I make these trips to tropical or semi-tropical climes, I'll plan to slip away from my fellow seniors to see what butterflies I can find. (They'll all be in classes studying the history and culture of Cuba, etc.) Sometimes I succeed in luring away a few colleagues to join me. Who knows, some of those I've lured in the past may be avid butterflyers today. I like to think so.

I made a similar trip to Cuba in 1997. That one was to eastern Cuba, around Santiago de Cuba from whence Fidel Castro nearly half a century ago commenced his march west to Havana to seize control of the government. This time I'll be in Havana and central Cuba. I wonder if the same species of butterflies will be flying.

On that earlier trip I identified 34 species, of which 22 were lifers. I relied principally on a huge tome I carried with me called "The Butterflies of the West Indies and South Florida." It's been fun to go back through the pages of that book to see my notes about just where and when I saw each of those 34 species. I had also marked up the book before that trip as to which species I MIGHT find. That work is serving me in good stead in preparing for this trip.

I'll also be keeping my eyes open for birds and – yes – dragonflies. Stay tuned.

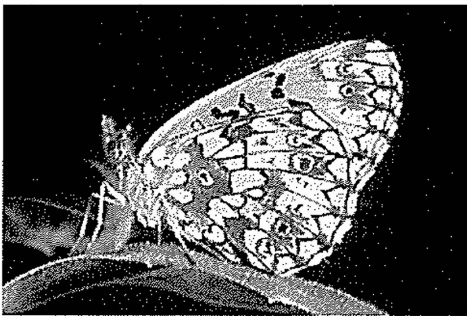
Silver-bordered Fritillary- *Boloria selene*

by David Nunnallee

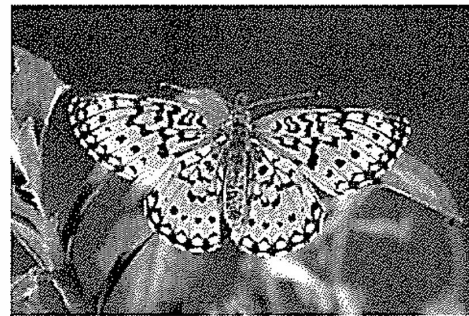
Note: All photos are by David Nunnallee.

Our species profile for this issue is the Silver-bordered Fritillary, *Boloria selene*.

Fritillaries belong to the very large worldwide family Nymphalidae, the brushfoots. All fritillaries have a similar appearance dorsally, tawny-orange to carrot-orange with a complex pattern of black lines and dashes. "Frits" are divided into two groups, the greater fritillaries and the lesser fritillaries. The greater frits are generally larger and have oval spots, often silvered, on the ventral hindwing (vhw). The lesser frits are smaller and have white, or, in one Washington species, silvered, spots on the vhw which are not oval in shape. All greater frits in Washington belong to the genus *Speyeria*, and all lessers are in the genus *Boloria*. The smallest *Speyeria* (*S. mormonia*) is about the same size as the average female *Boloria*. In Washington we have eight species of greater frits and six species of lessers.



B. Selene—Adult, Ventral



B. Selene—Adult, Dorsal

Of our six lesser fritillaries only two are widespread and easily found, while the other four are localized to rare. *Boloria selene* is one of our localized species, found in only a few places in the state, generally boggy habitats where violets grow. One tiny, localized population is found just southeast of Yakima at the Moxee Bog, a tiny relict population probably left over from the last ice age. This area is protected by the Nature Conservancy, but butterfly numbers are shrinking and the colony is unstable. More robust Silver-bordered Fritillary populations are found in Okanogan County, particularly in the Mary Ann Creek area east of Oroville. *Boloria selene* is a candidate for listing in Washington, and in some other states, such as Illinois, scientists are attempting to reintroduce this species to areas where it was earlier extirpated by agricultural practices.

The Silver-bordered Fritillary is circumboreal. In North America it occurs widely across parts of Alaska and much of Canada, extending south into the northern part of the U.S. across the entire country. Along the Rocky Mountains its range dips the farthest south, into northern New Mexico. In Washington the Silver-bordered Fritillary can be found in Okanogan County and in the far northeast corner of the State, and tiny relict populations occur in at least five seep or bog areas across the Columbia Basin.

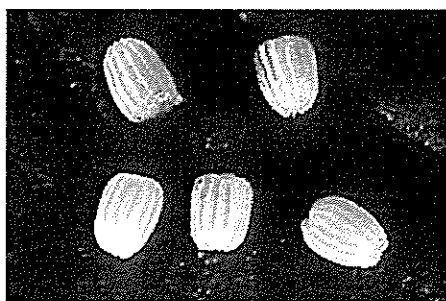
In Washington the Silver-bordered Fritillary is our only fritillary which is double-brooded, and in other regions it may even be triple-brooded. Second brood adults lay their eggs in July or perhaps even August, on or in close proximity to their violet food plants in seeps or boggy areas. After hatching the larvae feed up to second or third instar, then diapause through late summer and winter, becoming active again in the spring. They pupate and emerge as first brood adults in mid-May of the next year. The first brood adults repeat the cycle, except that their larvae do not diapause, but feed straight through, pupate, and emerge



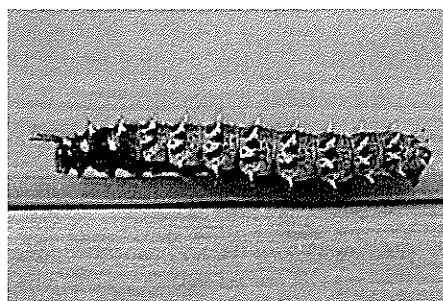
B. Selene—Pupa

as second brood adults in July. The eggs have a truncated rounded-cone shape with numerous ribs, each rib with many small lateral cross-grooves. This egg shape is typical for all fritillaries. The larvae are splotchy gray with dark brown spots, a dorsolateral row of gold spots and numerous branching spines. Two "horns" extend forward over the head, appearing about third instar and growing rather long by the fifth instar. In the later caterpillar instars the head region becomes black, contrasting with the light gray-colored body and now-golden spines. The larva grows to about one inch before pupating to a handsome light brown chrysalis. The chrysalis has indentations and spiny projections, hanging suspended from a silk pad (cremaster), but lacking a silk girdle.

The Silver-bordered Fritillary is the only lesser frit in Washington which has silvered spots on the vhw. These spots are not oval in shape, making the species easy to separate from greater frits of similar size (Mormon Fritillaries). While the silvering of the spots is diagnostic, the central spot on the vhw is also distinct in shape, being roughly rectangular with the inner and outer corners truncated obliquely.



B. Selene—Eggs



B. Selene—Fifth Instar Larva

Males patrol conspicuously over grassy, boggy areas in the vicinity of violets, looking for females. Their flight is relatively slow and wafting. Females generally stay low in the vegetation and out of sight, and are best found by walking through the area and flushing them to flight, but care should be taken not to crush the violet foodplants underfoot.

New Research Into Butterfly Flight

G'Num's readers know that butterflies move with impressive grace and unpredictability. Recent research sheds more light on our impressions of butterfly flight. In the 12 December, 2002 issue of *Nature*, scientists at the University of Oxford report on high-speed digital photographs of free-flying red admirals. The images show the patterns of the butterflies' flight.

The research confirmed that butterflies use many different types of wing strokes, and they might use them in any order. According to the report in *Nature*, "butterflies possess an impressive repertoire of aerodynamic mechanisms, which they employ in different circumstances and with great virtuosity." And, not surprising to anyone who has tried to catch a butterfly, they use these aerodynamic methods in unpredictable order. The *New York Times* compared the red admirals' flight pattern to a gymnast doing floor exercises, or a person progressing down the sidewalk by "hop, skip, jump, cartwheel, and back flip, in no particular order."

The scientists hypothesize that some of the randomness in the red admirals' flight may be a strategy for eluding predators. Butterflies that are less desired as prey have less randomness in their movement. The researchers noted that red admirals have a habit that made them good subjects for the study. Because they have sensors in their feet that detect air movement, they lift a foot before they take off, signalling the scientists to start photographing.

One of the interesting moves described is the "clap and fling". During this motion, butterflies' wings touch each other ("clap") which pushes the butterfly off. Then the wings are pushed rapidly apart ("fling"). The fling motion produces a short inflow of air, which gives lift. Butterflies and some wasps are the only insects known to use this type of movement, possibly because it bashes the wings together.

Another technique is a rotation of the wing at the end of the downward stroke, creating a backspin that produces lift similar to the movement of a curve ball or sliced golf ball. The butterflies rotate their wings continuously so the "angle of attack" changes through the downward and upward strokes. The wings accelerate and decelerate between stroke reversals; they stop twice during each wingbeat cycle—they are never in steady motion.

A comment in *Nature* notes "It ... leaves one wondering how, with such a small brain, insects exercise flight control over such a wide range of aerobatic abilities. If engineers ever understand that, there will be a revolution in aeronautics."

Information for this article is derived from the 12 December 2002 issue of *Nature*, and the 12 December 2002 edition of the *New York Times*.

Jon Pelham Invited to British Museum

"Distinguished" might not be the first word to come to mind when meeting Jon Pelham, but the word certainly describes Jon's work. Jon has been invited to the British Museum in London, England to discuss his catalog of butterfly families with an international group of scientists.

Jon's primary purpose for visiting the British Museum is research. For the past twenty or so years, Jon has been working on a catalog of the butterflies of the United States and Canada. The catalog is much more than a list of the names of the butterflies—it includes the current name of each species; the earliest name and original description of each species with bibliographic references to the first publication that identified each species; the original name combination (family, genus, species); Jon's comments and analysis of the development of knowledge about the species with more references to the literature and location of materials; identification of the lectotype*; and a bibliography. This catalog also includes information about all the synonyms and subspecies of each species. The British Museum holds original materials that are not available elsewhere that are essential to Jon's work.

Two publishers have expressed interest in Jon's butterfly catalog, which is approximately 1300 pages. Jon hopes his book will elicit discussion and help lepidopterists understand the names of butterflies so that, in Jon's words, "names will no longer be so important, and we can study biology and the organisms themselves."

The meeting with the other scientists will center on another of Jon's projects: a catalog of butterfly family groupings. This catalog lists all the family groups that have been proposed with a bibliography. Jon and the others will discuss future plans for the arrangement of butterfly families.

**Editor's Note: A lectotype is defined as a specimen designated as the individual physical specimen chosen to represent a species or subspecies.*

WBA Tee Shirts

Beautiful and stylish WBA tee shirts are available! Two designs can be ordered: a bright blue shirt with an Indra Swallowtail design and the WBA name; and a dark green shirt from the 2002 Annual Conference with a California Sister design. Shirts are \$15.00. If you'd like a shirt, contact

WBA E Mail Notice Line

Don't forget to sign up for WBA's notice line. It's a members-only service that offers the opportunity to hear about WBA activities, local butterfly sightings (in season, of course), notice of room or program changes for the monthly WBA meetings, and other interesting things.

Do You Have Any Back Issues of *American Butterflies*?

If so, WBA would like to know. We are starting a collection of the back issues of the North American Butterfly Association publication, *American Butterflies*. Issues will be available for members to borrow.

Officers/Board Members

Richard Youel	President
Dave Nunnallee	Vice President
Mardell Moore	Secretary
Marty Hanson	Treasurer
Idie Ulsh	Programs
Käthe Watanabe	Membership
Jon Pelham	Science Advisor
Tom O'Connell	Writer/Reporter
Jo Nunnallee	Hospitality
Mary Maxwell-Young	Social Events
Maureen Traxler	Newsletter
NonBoard Position: Bob Hardwick is WBA Research Coordinator, organizing WBA field projects.	

Membership Application

<https://wabutterflyassoc.org/membership/>