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Volume 11, Issue 4 Table of Contents ISSN 1554-1169

Isotria verticillata

Front Cover

Photo: Melissa McCormick

Table of Contents

Inside Front Cover

Dr. Ken Cameron - The 2014 Raven Award Winner

Page 1

A Funny Thing Happened on My Way Home From the Conference,
or Never Walk in Quicksand Alone
T. Sampliner

Pages 2-5

Ongoing studies of *Isotria medeoloides*, Small Whorled Pogonia

D. F. Whigham, M. K. McCormick, and J. P. O'Neill

Pages 6-11

Hunting for Chamisso's Orchid on Vancouver Island (BC, Canada) Pages 12-20
T. Nelson

The Native Orchid Conference, data

Inside Back Cover

Piperia elegans (elegant piperia)

T. Nelson

Outside Back Cover

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Dr. Ken Cameron - The 2014 Raven Award Winner

In late July, 2014 the American Society of Plant Taxonomists awarded Dr. Ken Cameron, Professor of Botany and Director of the Wisconsin State Herbarium at University of Wisconsin-Madison, the Society's 2014 Peter Raven Award.

The Raven award recognizes the outstanding accomplishments of Dr. Cameron for his efforts in public outreach on behalf of plant research and conservation.

Dr. Cameron is one of the world's experts on systematics of the orchid family, focusing particularly on the genus *Vanilla*. In addition, his laboratory researches the evolutionary history of many other tropical plant families. He is currently part of a team studying the interaction of evolutionary history and ecology in shaping the flora of Wisconsin.

As director of the Wisconsin State Herbarium, Ken manages over 1.2 million specimens, including a major collection of arctic lichens.

Ken is a long time friend of the NOC, having been a speaker at numerous annual meetings. His ability to communicate very complex subjects in ways that all can understand is remarkable. Ken also participates in NOC field trips and his warmth and openness to all are marks of his total dedication.

Congratulations to Ken on this well deserved honor, and he is wished much success in the future.

A Funny Thing Happened on My Way Home From the Conference, or Never Walk in Quicksand Alone!

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(note: all figures are by author unless otherwise noted)

It had been eight years since I had last visited a site in Southwestern Michigan mentioned by the late Fred Case in his monumental book, *Orchids of the Western Great Lakes Region* (Cranbrook Institute of Science, 1964). This time I was joined by Dennis Horn, fellow Native Orchid Conference member and a resident of Tennessee. He and I were in separate vehicles. As a matter of fact, Dennis and I were returning from this year's conference at Lake Itasca and I had retrieved my car so that after this last stop he would head south, homeward bound while I would depart to the east toward my home in Ohio.

This article does not reveal the name of the site to help protect it. Protection is important as this is one of those special sites where a natural hybrid occurs between two native species. This site is similar to one more widely known among members of this society in Eastern Pennsylvania.

In this case, the species involved are the Eastern Prairie Fringed Orchid, *Platanthera blephariglottis* and the Yellow Fringed Orchid, *Platanthera ciliaris*. Their progeny is known as *Platanthera x bicolor*. The first hybrid figured (Fig. 1) shows the



Fig. 1. *Platanthera x bicolor*.

Digital: DSC06195.

Sat-19Jul-14.

heavy influence of white *P. blephariglottis*, while the second hybrid (Fig. 2) shows the similar dominance of the other parent, the Yellow Fringed Orchid, *P. ciliaris*, but, on close examination, showing traces of white from the other parent. A third color form (Fig. 3) showed an even more equal blending of both parents. For those unfamiliar the accepted way to express a hybrid is to first name the genus then follow with an “x” to demonstrate the hybrid status followed by whatever name has passed official taxonomic approval. What is *not* told by such a designation is the diverse color gamut that such specimens can exhibit. Hopefully these figures will convey some of the broad range of the color spectrum one may find at this special location. However, what these images cannot convey is the adventure one undertakes visiting and walking around at the site. This I have to retreat to the written word to convey.



Fig. 2. *Platanthera x bicolor*.
Digital DSCO6211. Sat-19Jul-14.

To set the stage, we were visiting a large bog in Southwestern Michigan on state land. The day was pleasantly warm but not oppressive. Light breezes occurred but not to the extent they would make photography problematic. Hopefully the bugs were still on break so that they also would be of minor importance.

It is probably a good tactic to first walk to the bog perimeter to get a good visual image of the terrain and where things were for planning access and how to exit. We could discern that based upon our eight year old prior experience we would need to get to the extreme rear of the bog to our far left as we faced the open terrain. There we could see little rooms or pockets of shrubs such as high bush blueberry, *Vaccinium corymbosum*, leather leaf, *Chamaedaphne calyculata*, and robust royal ferns, *Osmunda cinnamomea*, that were making inroads into the otherwise uniform looking wetland. It would be here in the still sunlit but fast enclosing taller vegetation that our prizes, the orchids, were holding forth.

Normally, walking through a special wetland such as a bog or fen is not an unexpected condition for folks like us: orchid nuts. However, in this instance, a surprise awaited the unwary. That would be me! As we neared the target area, I saw a very low crushed trail-like pathway that appeared to me to be an animal path.

Well, why not let the animals do some of the work, right? After all I was carrying a heavy backpack, tripod, canister with stakes and background mounted on bamboo. So I took to what I presumed was the “easy way”.

The first few steps were no problem and I was congratulating myself for having chosen the less exerting pathway. My next step with right leg extended then putting full weight upon it was nearly my last. Without any warning, I sank all the way down so far that my rear was literally balanced upon the substrate. I couldn’t lift myself out! In fact I could hardly move that limb. I tried laying equipment to one side and sliding my backpack onto sturdier neighboring ground. I still couldn’t lift



Fig. 3. *Platanthera x bicolor*
Digital: DSC06228. Sat-19Jul-14.

or pull out my right leg. In fact, any effort to extract myself led me to conclude I would lose boot, socks, and who knows what else. Fortunately, Dennis was relatively nearby.

There was no other ambient sound so we were able to communicate freely. Dennis relieved me of equipment. That now out of the way, I could accept a strong arm from Dennis while my own arms kept trying to push down on the substrate while occasionally securing my right boot. We eventually extracted me from the soup or perhaps quicksand. Yes, I reluctantly sacrificed my chance to appear to future generations as the long lost peat man from Southwestern Michigan. If it had been in my home state of Ohio, I would have had to seriously reconsider this lost opportunity.

Having given up my chance for posterity, I returned to the mundane task at hand, looking for and taking images of the orchids, including a close-in one of a few flowers of the dominantly yellow form (Fig. 4). Later, when reviewing images, I couldn't resist including a composite digital of both species; white and yellow, together with an orange hybrid of *P. x bicolor* (Fig. 5).

After all this fooling around, the day had become late enough in the afternoon to have taken on the aspect of those golden tones we photographers so love to work in. There were specimens giving the appearance of nearly pure versions of both parents. There were also those that



Fig. 4. *Platanthera x bicolor*
Digital: DSC06217. Sat-19Jul-14.



Fig. 5. Downsized & altered parents & hybrid.
Hazelton, Pennsylvania. Tues-29Jul-08.

reflected combinations showing a rich heritage borrowing heavily from both. One could find specimens leaning heavily toward the orange typical of the yellow fringed with perhaps only fringes and spurs, showing evidence of the white parent. White specimens were also influenced with orange by that parent; however, in addition, one could find white specimens with lime yellow that washed the spur and sometimes the fringe or even a few that were basically entirely lime yellow. These were some of the more interesting as they reflected neither parent directly as to color. It is interesting to observe the deviation of hybrids from

the normal color gamut of either parent into something clearly new.

Finally, our day was done as the light was really starting to fade. We were both getting very hungry from our many hours out of doors, plus the "ordeal" of avoiding my premature "empeachment".

Ongoing studies of *Isotria medeoloides*, Small Whorled Pogonia

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Isotria medeoloides, Small Whorled Pogonia (Fig. 1) has the distinction of having been listed as an endangered species by the USFWS and then down-listed to the threatened status when more populations were located in New England. In ad-



Fig. 1. *Isotria medeoloides*, The Small Whorled Pogonia. Photo by Melissa McCormick.

dition, it may be unique among federally listed plant species because the definition of population viability is different in the northern and southern portions of its distribution. In the northern part of its range, a population with a mean over 3 years of 20 or more individuals is considered to be viable. In the south, populations of fewer than 20 individuals are considered to be viable if plants have consistently emerged over 15 years. A recovery plan for the species was published in 1992 and an overview of information on the species is available at: <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1XL>

Despite this improvement in its listing status, all evidence points to a species that is in trouble, especially in the southern part of its range. As expected, a species that is endangered or threatened should be the focus of intense studies designed to understand the problems that it faces and try to find ways to assure its survival.

There have been several studies that have assessed the ecological status of the species (Mehrhoff 1989), including reproductive ecology (Mehrhoff 1983, Vitt and Campbell 1997) and genetic variation (Stone *et al.* 2012). Brumback *et al.* (2011) demonstrated that populations of *Isotria medeoloides* in New England benefited from an increase in light after the forest canopy was thinned. Our research group has partnered with the National Park Service and the U.S. Army to study *I. medeoloides* in the southern portion of its range where it appears to be in decline. Here we report on some of the preliminary results of our research, but providing answers to assure the survival of this species will not be easy. We start with an evaluation of what is and what is not known about the species' life history. We then describe some results of ongoing monitoring efforts and research at two sites in Virginia. We conclude with a description of a new project in West Virginia, where *I. medeoloides* is considered *Highly State Rare* (West Virginia Natural Heritage Program 2012).

Temperate orchid population dynamics are often primarily limited by one or more life history stages (seeds, protocorms, seedlings, vegetative plants, flowering/fruiting plants, dormant plants). Vegetative dormancy is of particular importance for *I. medeoloides* in the southern part of its range. Dormancy, which really is not dormancy in the strict sense of the word (Shefferson 2001, 2009), reflects a failure to emerge aboveground for at least one year. Although a common feature observed in many native terrestrial orchids, there have not been enough species-based monitoring studies to evaluate the role this type of dormancy plays among the more than 230 species of native orchids in the U.S. and Canada. We know, however, that some species are able to survive underground for a few to many years (Shefferson *et al.* 2001) and then appear aboveground again. Doug Gill of the University of Maryland, for example, has reported that individuals of *Cypripedium acaule* in the George Washington National Forest have appeared more than two decades after he had last seen them aboveground with leaves (Gill 1996). At the two *I. medeoloides* sites that we have been monitoring in Virginia, the majority of plants have entered dormancy after being observed aboveground for only 1 or continuously for 2 or 3 years (Fig. 2). We don't know how many of the plants that have entered dormancy have survived but a few have re-appeared, indicating that the others may still be alive but remain dormant. This May we found a new plant that was flowering very close to one of our marked plants. The discovery of the 'new' plant means that it has been living belowground for at least 5 years or had germinated and grew underground; only emerging once it was quite large. It could also have been a small seedling that we had missed in previous years, but this is not likely, as we carefully examine the sites to look for new plants during each of our surveys. The presence of the new plant this year and the appearance of a small number of plants that entered and later emerged from dormancy indicates that individuals are capable of surviving underground for multiple years. We don't know how long they can survive as dormant plants, however, but it must be at least six years based on our cur-

rent monitoring efforts. Dormancy of up to 9 years has been noted in New Hampshire, though such long dormancy was rare and was only observed twice over 18 years of observation of 147 plants that entered and emerged from dormancy (Cairns 2001). We assume that all of the dormant plants are closely associated with one of the fungi in the genus *Russula* – the genus of ectomycorrhizal fungi that associate with *I. medeoloides*. We plan to continue the monitoring project to determine how long individuals can survive underground and appear again.

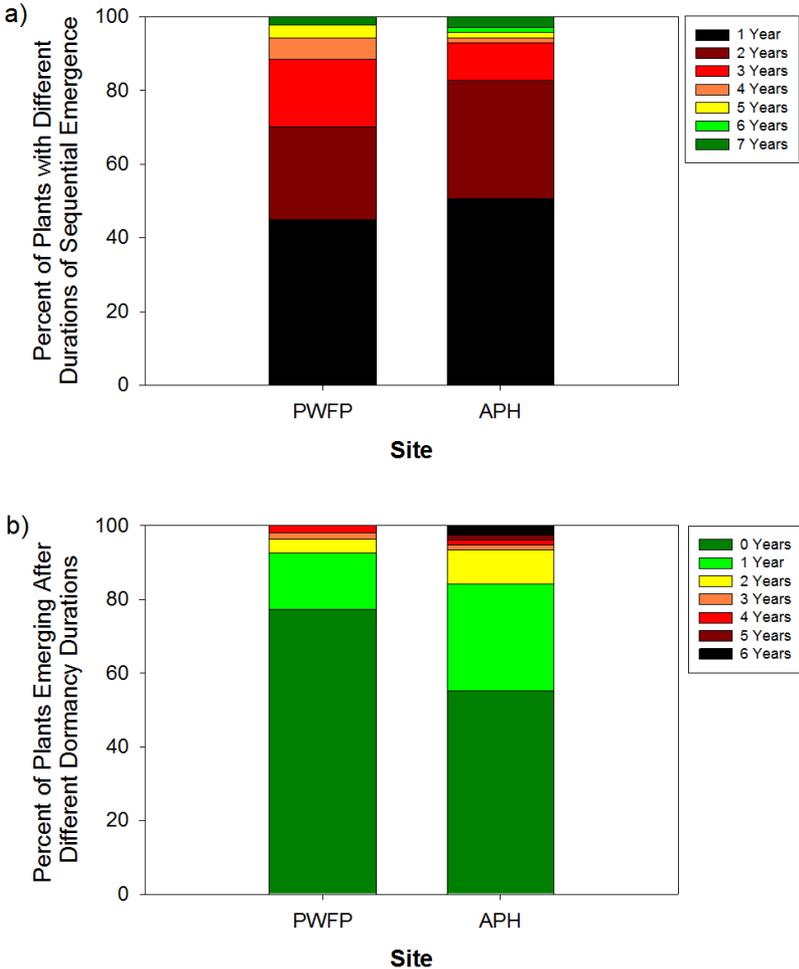


Fig. 2: Patterns of emergence in *Isotria medeoloides* at two sites (PWFP and APH) in Virginia. a) Years of sequential emergence before entering or re-entering dormancy. b) Dormancy duration of all plants that entered dormancy and subsequently re-emerged. Dormancy duration of 0 years indicates plants that emerged in multiple sequential years without entering dormancy. Dormancy durations >0 are only given for plants that re-emerged following dormancy and do not include plants that may have entered dormancy but have not yet re-emerged.

We can't manipulate *Isotria medeoloides* due to small numbers of plants and the permits under which the studies are being conducted. Therefore we conduct experiments on the closely related species, *I. verticillata* (Fig. 3) to explore possible causes of dormancy; a condition in native orchids that remains to be understood (Shefferson 2009). From a preliminary study of *I. verticillata*, we know that removal of the apical bud – individual plants only produce one bud per year – at different times during the dormant season does not result in plants becoming dormant. Almost all of the plants with manipulated buds were able to produce another bud and emerged the following spring. Of course, we don't know if the same situation exists for *I. medeoloides*, but our monitoring studies have shown that plants that remain aboveground for an entire growing season and produce an apical bud by the end of the growing season usually emerge the following spring.



Fig. 3. *Isotria verticillata*.

Photo by Melissa McCormick.

We have also found that the driver of this process seems to be whether plants that are aboveground produce a bud by the end of the growing season. Clearly we

need to know more about the factors that are responsible for bud formation as that is a key component in the ecology of individuals and the presence of a bud is an indicator that they have the potential to emerge aboveground the following spring.

Another aspect that is important is the relationship between *I. medeoloides* and mycorrhizal fungi. Terrestrial orchids form mycorrhizal relationships at all life history stages (Rasmussen 1995) and efforts to conserve and restore native orchids must include measures to assure that the appropriate fungi are present. The life history stages where the orchid-fungus link is essential are the protocorm and dormancy stages. The protocorms of native terrestrial orchids are non-photosynthetic, and thus the transition from a germinated seed (undifferentiated embryo) to a seedling only occurs when the orchid obtains resources from an appropriate fungus. Thus far, we have not encountered a protocorm of *I. medeoloides* in the field and we have been unsuccessful in numerous attempts to germinate seeds in the laboratory or field. Even if we eventually learn how to germinate the seeds, matching them to the appropriate *Russula* species will not be easy, as all fungi in that genus obligately form ectomycorrhizae with trees and it is very difficult to grow ectomycorrhizal fungi in the laboratory. A hopeful sign, however, is based on the work of Rachel Rock-Blake (2014), a recent MS student at the University of Connecticut. Rachel has been working with us on *I. medeoloides* and found that Russulaceae fungi were significantly more abundant in the soil around plants that were aboveground compared to plants that were dormant. At the same time, we found that the fungi were present in areas with dormant plants, suggesting that if we could improve site conditions for the growth of the fungi (i.e., there would be more Russulaceae fungi) that the orchids are also likely to respond positively. In a follow-up study conducted at Fort A.P. Hill with intern Hope Brooks, we also found that plants in locations with less abundant Russulaceae were more likely to be dormant, further supporting a link between orchid dormancy and the abundance of their mycorrhizal fungi.

Our research thus far has demonstrated that there are many hurdles that need to be overcome before we can develop a successful program to cultivate the small-whorled Pogonia and develop protocols that will enable the successful restoration of viable populations in nature. While we and others continue to work on these difficult problems, there is some hope that habitat manipulations may benefit populations. As noted above, Bill Brumback and his colleagues in New England thinned the canopy in areas where *I. medeoloides* grows, with appropriate controls, and found that there was a positive response (Brumback et al. 2011). We have employed a similar approach at Fort A.P. Hill and while it is too early to tell what the responses of *I. medeoloides* will be an initial survey of the populations by Robert Floyd included the appearance of a flowering plant in one of the areas where we thinned; a first as there had never been a flowering plant in that population over the 9 years that it has been monitored. Two other populations where we thinned have seen a considerable increase in the number of 'new' plants.

The final bit of information from our ongoing efforts is a study that we have initiated this year in the mountains of West Virginia. *Isotria medeoloides* was known to occur in only one county (Greenbrier) in West Virginia but two small populations were recently found in a different county. This new project is an excit-

ing possibility because the West Virginia plants are geographically southern populations but they are located inland of our current study sites and at an elevation where the climate is more like parts of New England than the Coastal Plain and Piedmont of Virginia. Understanding genetic and climatic differences between northern and southern populations will help determine whether different factors drive population dynamics across *I. medeoloides*' range and whether different conservation techniques will be needed to be successful. Will these populations act more like their northern or southern brethren? Stay tuned!

Acknowledgments

The research has been supported by the U.S. National Park Service and Fort A.P. Hill. We would especially like to thank Jason Applegate and Robert Floyd, collaborators at A.P. Hill for their enthusiastic and continued support.

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Hunting for Chamisso's Orchid on Vancouver Island (BC, Canada)

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(note: all figures are by author unless otherwise noted)

In 2010 I became acquainted – through internet orchid-research - with Ron Hanko, who resides in Lyndon, Washington, north of Seattle. Ron is keenly interested in the natural world and has been diligently studying and photographing the orchid species native to the Pacific Northwest in recent years. Fast-forward to July 21, 2011. My family (wife Jackie, daughters Johanna and Christina) is on vacation in Victoria, British Columbia and Ron and I are going to meet for the first time to be guided to a site for the hard-to-find *Platanthera chorisiana* (Chamisso's orchid) by Dr. Hans Roemer, consummate Vancouver Island-based botanist and retired ecologist for the Government of British Columbia. The story of this field trip goes back nearly nine months from the meeting and certainly bears telling.

P. chorisiana has a wide range that extends from Japan, throughout the Aleutian Islands and southward through the Queen Charlotte Islands and Vancouver Island to the state of Washington. Quite common in the more northern parts of its range, it becomes harder to find as one goes south. There is a specimen in the herbarium at the New York Botanical Garden collected by the legendary Canadian botanist John Macoun on July 20th, 1909 in Uclulet, BC. The label reads: "First report from continental North America...RARE!" Long thought to be rare, it is in reality more often overlooked, as it often grows hidden in grasses and mossy turf.

Two well-documented sites in Washington State have been known for at least fifty years, but when I asked Ron Hanko in the fall of 2010 about them he informed me that he had searched the better known of the two, a lakeside sedge mat habitat, four different times and had found nothing. And the other site—of around fifty plants—had unbelievably been totally obliterated by a rockslide in 2009! He was also very eager to see the species and suggested trying to find a location on Vancouver Island.

I've learned over the years that if one wants to see a particular orchid species but has no site information that the best thing to do is to call up a local herbarium, so I called the herbarium at the Royal British Columbia Museum in Victoria, BC and asked the gentleman who answered the phone if he knew where I could find *Platanthera chorisiana*. He replied that he wasn't in the field much anymore and couldn't really help me. When I asked if he knew anyone that might know he said to hold on a minute and putting the phone down, yelled out "Hans! *Platanthera chorisiana*?" I heard a voice yell back "Jordan River Plateau!" Before long Hans

Roemer was on the phone and was telling me that yes, he had seen the species at a location about 50 km north of Victoria about ten or so years ago and would send me more information. He later emailed me an aerial photo of the site complete with UTM coordinates and generously offered to guide me to the site if his schedule allowed. Fast-forward eight months and everything was working out marvelously; Hans was meeting Ron Hanko and myself at my hotel and was driving us to the Jordan River Plateau. Exciting!

It was just past 9 a.m. and our orchid-hunting party (Fig. 1) was traveling down the coastal highway on Vancouver Island towards the small west coast town of Jordan River. Hans was driving his well-traveled Subaru Forester, with me in the front passenger seat and Ron Hanko and Ryan Batten, a recently graduated botany student, in the back seat. Hans and Ryan had just returned from a botanical expedition to the interior of BC and their return had luckily coincided with our visit to Victoria. Hans and Ryan had made a reconnaissance trip up to the Jordan River Plateau before their trip and after searching the area where Hans had seen the orchid years ago for quite some time, eagle-eyed Ryan had skillfully located several specimens of *P. chorisiana*, not yet in bloom, well-concealed in the undergrowth. Hans had taken GPS coordinates and marked the location as well. This was much



Fig. 1. Orchid hunting team members (left to right) Ron Hanko, Hans Roemer, and Ryan Batten.

appreciated, as it took a lot of the uncertainty out of today's foray. We were able to get acquainted as we drove and learned that Hans is a retired BC provincial government botanist and ecologist. He told me how lucky I was to catch him at the herbarium that day, as he is not there that often.

It was a foggy overcast day and after reaching the town of Jordan River, about

two hours west of Victoria, Hans turned off the main highway and followed a series of logging roads up to the plateau, which is about 2000 ft. in elevation. We stopped at a wet boggy area—perfect habitat for this orchid which likes cold, high-altitude bogs—and before I could even get my bog shoes on, Ryan had located a prime *P. chorisiana* growing on a drier raised hummock next to a tree. As I photographed, Ron and Ryan located several more in the same bog, all growing on the north side of trees. There were two other orchids growing in the bog as well: *Platanthera dilatata* var. *dilatata* and *Platanthera stricta*.

As we hiked to the other site, Hans told us how he had found the area back in the 1970s by studying aerial photos of the region. After noticing a series of fens and bogs in this part of the plateau, he had first explored those spots on cross-country skis for greater ease of mobility, returning in the summer to investigate the botanically interesting areas. The area was very beautiful, with lots of fascinating plants—another great place that I never would have seen if I hadn't been chasing after an orchid...

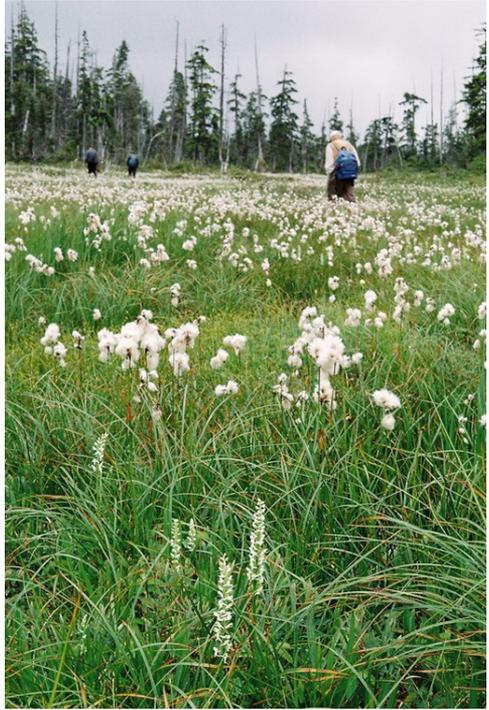


Fig. 2. Open fields of cotton grass and *Platanthera dilatata* var. *dilatata*.



Fig. 3. Swamp Gentian (*Gentiana douglasiana*).

We hiked for a few hours through open areas full of cotton grass (*Eriophorum angustifolium*) and *Platanthera dilatata* var. *dilatata* (Fig. 2) along with numerous wildflowers. *Lilium columbianum* (Columbia lily) *Gentiana douglasiana* (swamp gentian (Fig. 3) *Nuphar polysepala* (yellow pond lily) *Tofieldia glutinosa* (Sticky false asphodel) *Dodecatheon jeffreyi* (Jeffrey's shooting star) and *Ledum groenlandicum* (Labrador tea) were all in bloom. There was evidence of bears everywhere with a lot of scat (some of it fresh) and skunk cabbages dug up with their roots eaten, but thankfully no bears. This didn't seem to bother Hans

one bit. There were numerous deep holes in the bog and I of course managed to step in one and went in over my knee but was unhurt.

We eventually reached Hans's original site, an open bog forest of dwarfed *Tsuga mertensiana* (mountain hemlock) and *Chamaeaecyparis nootkatensis* (Alaska cedar). The two dominant herbaceous plant species were *Caltha leptosepala* (mountain marsh marigold) and *Fauria crista-galli* (deer cabbage). Hans told me



Fig. 4. *Platanthera chorisiana* and *P. stricta* growing in bog area.

that the soil in this habitat is acidic, even though the organic surface soil is not very deep, unlike in a Sphagnum bog. We discovered that the flagging tape had blown down and that the plants were not immediately apparent in the lush under-story. Ryan seemed to be the best at spotting them and after he found the first one, a diligent search eventually turned up about a dozen plants. Two other orchid species were also present: *Platanthera stricta* (Fig. 4) and in one area, *Listera cordata* var. *cordata*. I had come a long way to see *P. chorisiana*, so I set to work photographing it for the next hour or so, finding it nearly impossible to get my camera at the correct angle to capture an image of the inner parts of an individual flower. Definitely not a trophy species—but of great interest to the dedicated orchid researcher—Jackie and the girls, who had wisely stayed in Victoria sightseeing, would have no doubt exclaimed “That’s it?” had they seen it. A miniature orchid 6-20 cm tall, the minute, fleshy flowers are only 2-3 mm across and are quite interesting when viewed under a hand lens. Carlyle Luer, in his seminal work *The Native Orchids of the United States and Canada Excluding Florida* offers the following technical description of the flowers, which to me resemble a cross between space aliens and Brussels’ sprouts:

“The lateral sepals usually spread to some degree, but the dorsal sepals, petals and rounded lip form a perfect little sphere as they huddle around the column, allowing only a small crack in front. From behind the flower projects the miniscule blunt spur. Within, the nearly microscopic anther-sacs diverge only a trifle to either side, above the stigma.”



Fig. 5. *P. chorisiana*, plant.

Fig. 6. Part-inflorescence.

Fig. 7. Flower, close-in view.

Over the last five years of orchid hunting I have learned some fail-proof techniques for obtaining good plant images in the field. For entire plant portraits, use of a tripod is essential; that coupled with either a 50 mm or 105 mm macro lens with the aperture set at F32 and a slow shutter speed—often as slow as ½ second for maximum depth of field— and of course the obligatory shutter release cable, all combine to make a great image. The final touch is a black background; orchid friend Scott Shriver of Pittsburg has kindly provided me with some custom-made black velvet backgrounds of different dimensions that conveniently roll up for easier transport. If it is windy or sunny, a diffusion tent with a black background is used. For close-up work, the use of a lens-mounted ring-flash (usually with one or two extension tubes) to me is essential. This allows the photographer to “grab” shots without a tripod (if a lighter 50 mm lens is used) as the flash allows for hand-held shots at F32 at 1/60 sec. (Figs. 5, 6, & 7) Noted flower photographer Ron Parsons of San Francisco introduced me to ring-flash.

All this playing around with equipment is very time consuming and my field companions were very patient as I worked. Hans entertained himself by photo-

graphing me in my usual position: flat on my stomach in a bog! (Figs. 8 & 9) Blessedly, the bogs and forests in western North America are not nearly as bug-infested as those in the east, making everything much more enjoyable. After I packed up we headed to a nice dry hilltop that Hans knew of for lunch and then began the hike back to the car. Being in the field with someone like Hans is a real learning experience; his encyclopedic knowledge of botany runs the gamut of the Plant Kingdom and he knows the scientific name—including the synonyms—of every taxon we came across: lichens and mosses, ferns and fern allies, trees and shrubs, grasses and sedges, as well as all of the vascular flowering plants. He is also a great woodsman and guided us to the remote bog and back without a compass. At one point on the return trip he corrected Ryan, who was leading the group,



Fig. 8. The author, photographing hand-held while lying on stomach. (image by Hans Roemer)
Inset: Fig. 9. plants of *P. chorisiana* photographed by author.

saying “You don’t want to go down that way...bear left up the hill.” In addition, we had really lucked out weather-wise; the fog had lifted and the sun was now shining brightly. We found several more *P. chorisiana* on the way out, making for a total of around fifteen plants—not bad!

As we drove back to Victoria I asked Hans about the geology of Vancouver Island. He told me that there are no calcareous wetlands on Vancouver Island. Although there are some limestone areas in the mountains, all habitats below tree line were originally covered by much the same rain forests as are found on other substrates. The main bedrocks on Vancouver Island are volcanic and to a lesser extent granite-type rocks. He knew I was wondering about *Cypripedium* habitat and informed me that there is a single report of *Cypripedium montanum* from one of the

central island limestone areas and a historic collection of *Cypripedium parviflorum* from near Victoria (now extirpated). He and Ryan also told me about the single population of *Cephalanthera austiniiae* (phantom orchid) on Vancouver Island, which is located near Victoria in one of the few limestone outcroppings on the island.



Figs. 10 & 11. Inflorescences of *Piperia elegans* (plants in flower on property of Hans Roemer).

When I told Hans that I had yet to see *Piperia elegans* (elegant piperia) (Figs. 10, 11, 12) he informed me that he had that species—the showiest member of the

genus— as well as *Piperia transversa* (flat-spurred piperia) (Fig. 13) currently in bloom on his property and that Ron and I were welcome to stop by to photograph them if we had time. It sounded good to me!



Fig. 12. *Piperia elegans* (elegant piperia)



Fig. 13. *Piperia transversa* (flat-spurred piperia)

On the way to Hans's house we stopped at Witty's Lagoon Regional Park, located on the coast 30 minutes west of Victoria, to view a population of *P. elegans* that grows in full sun and would hence be more robust than his plants, which grow in the shade. The plants, growing on a steep bluff overlooking the ocean, were deformed for some unknown reason—maybe a late frost—and unfortunately were not in good flowering shape.

Arriving at Hans's acreage on the outskirts of Victoria we were treated to several prime-blooming *P. elegans* and numerous blooming *P. transversa* growing in the woodland habitat he has lovingly preserved and restored by constantly toiling to remove invasive weed species. The property is a beautiful testament to many years of hard work. Some areas have been turned into formal gardens with other areas left as natural woodland. Growing under a canopy of trees, including many beautiful Pacific Madrone trees (*Arbutus menziesii*) were some still blooming *Brodiaea coronaria* (harvest brodiaea) an attractive member of the lily family, as well as *Goodyera oblongifolia*, another orchid species. After viewing the property and photographing for awhile, we retired to the house, where Hans's lovely wife Heidi generously provided us with coffee and tarts on the patio, a fitting end to an incredible day.

July 22 was our last day in Victoria and we spent the morning enjoying the sights of the wonderful city. Staying in the Inner Harbor area had been a wise choice; with access to the shops and museums and great views of the harbor and legislature building at night from our hotel balcony it was a memorable experience. Hans had invited me to return to his house today to photograph more extensively and I took him up on his offer. I really wanted Jackie and the girls to meet Hans and Heidi and also wanted to set up my “studio” and get good images of the two *Piperia* species, in case I didn't see them again on the trip, which turned out to be exactly what happened.

The family enjoyed seeing the property (Fig. 14) and after the photo session Heidi once again rolled out the Old-World hospitality, providing ice cream and coffee on the patio. It had been really great meeting these two generous people whom had helped make our visit to Victoria so much fun. We had really enjoyed our time in Victoria, where I had seen seven species of orchids, including one (for me) brand new one.



Fig. 14. The remaining members of the Nelson family; L to R: Johanna, Jackie, and Christina.

Note: Ron Hanks did finally locate *Platanthera chorisiana* in 2012 at the lake-side site in Washington State. This is one of the southernmost known populations of the species. Dr. Hans Roemer contributed over 100 photos and was a contributor to the recently published field guide *Alpine Plants of the Northwest* (Pojar & MacKinnon, Lone Pine Publishing, 2013). This book is a must-have for anyone interested in the flora of North America.

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