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Summary of the 6th Annual NOC Meeting

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The 6th annual Native Orchid Conference was held at the University of Miami in Coral Gables in Florida from 14 to 17 April, 2007. South Florida is rich in orchid diversity and therefore, the participants anticipated a visual and intellectual treat related to all things orchids. The conference included two days of talks and two days of guided field trips to see local orchids. The talks were held on 14 and 15 April, whereas the field trips were scheduled for the 16th and the 17th of April. Close to 60 participants were in attendance at the Miami conference.

A welcome address by President Lorne Heshka started off the meetings. Lorne said: "We are here to see orchids and to see orchid people, and for many of us seeing the people is more important than seeing the orchids." Lorne also reminded the attendees to fill out the survey and comment forms before departing from the conference.

David McAdoo, Conference Co-Chair, then presented some administrative comments and talked briefly about the logistics of the field trips.

First speaker of the conference, Roger Hammer, a Senior Interpretative Naturalist, talked about the 'Native Epiphytic Orchids of South Florida.' Roger informed the audiences of the 35 epiphytic orchids either currently known in Florida or in the historical record. He described his experiences in searching for all of these; he has either seen or at least searched for them all. His searches involve being on foot or in a canoe days at a time as he finds and photographs the epiphytic orchids in south Florida. He discussed *Vanilla planifolia*, which is the commercial species and though it is found in Florida, it is probably introduced. *Vanilla mexicana* is believed by some to also be introduced, but Roger considers it a native; much of its habitat in Florida has been destroyed by the recent hurricanes. Roger loves to find wild orchids that have been assumed missing from Florida or have not been documented for many years. It took him 5 years to locate *Lepanthopsis melanantha*. He then mentioned that mangrove-buttonwood woods are good habitat for epiphytic orchids. Here one can expect to find such species as *Prosthechea boothiana* which while often stripped from the wild for home gardens does not do well in cultivation. *Epidendrum nocturnum* also grows among the mangroves and buttonwoods. It is fragrant at night and is pollinated by Sphinx moths. Roger discussed the impact humans have had on the wild epiphytic orchids. *Epidendrum boricuarum* is probably no longer in the wild due to collectors. The cowhorn orchid, *Cyrtopodium punctatum*, was blooming at the time of the conference, but in the early years of the

last century it was hauled out of the swamps by the wagon load. Nature has also not been kind to Florida's orchids. Habitat for *Epidendrum rigidum* was hard hit by Hurricane Andrew. Places where hundreds once grew no longer have any plants. Roger attempted to rescue many plants by gluing them onto remaining surviving trees. In addition to hurricanes, other natural causes have damaged specialized and localized habitats. *Maxillaria parviflora* was discovered in Florida by Roger in 1974 with the only known plants growing on a single tree. The tree died and the plants have not been seen since. All the known plants of *Brassia caudata* were killed by a freeze in 1977 and that species probably no longer exists in Florida.

Next, Stig Dalstrom, Curator, Orchid Identification Center, Marie Selby Botanical Gardens, Sarasota, Florida spoke on 'Orchid Conservation – Why Should I Care?' Stig discussed the need to look at the big picture to protect orchids which are a part of the global biodiversity and with approximately 25,000 species, are one of the largest flowering plant families. Orchids, he said, are global plants and while humans relate better to animals, plants are the basis of all life on the planet. His fascination with orchids began when he was a child growing up in Sweden. His childhood room was transformed into a jungle and as he grew up he started studying species of *Cypripedium*, *Eipogon*, and *Neottia*. He then came to Selby Gardens to study tropical orchids and traveled throughout South America to witness the destruction of forests in the region. Stig described that orchid conservation is complex because many species remain undiscovered while many of those that are known are being lost to extinction. "To save a plant, we need to save the forest," he said.

Phil Oyerly of Greenville, Delaware next spoke on 'Hardy Orchids at Mt. Cuba Center.' Phil has been working at the greenhouse at the Center for over 25 years. Mt. Cuba Center is a 650-acre, non-profit horticultural institution in northern Delaware, and the mission of the center is to foster study, conservation, and appreciation of plants native to the Appalachian Piedmont region through garden display, education, and research. The activities and the resources at the center include garden displays, museum, education, horticultural research, land stewardship and biodiversity preservation. Selection of *Cypripedium* species suitable for gardens is one of the ongoing projects among other plant selection projects. In the past, *Spiranthes odorata* 'Chadds Ford' was developed at Mt. Cuba Center and has become a well-liked orchid for gardeners. The staff at the center also grow *Platanthera ciliaris*, *Tipularia discolor*, *Cypripedium pubescens*, *Cypripedium kentuckiensis*, *Calopogon* spp., and *Platanthera peramoena*. Surrounding Mt. Cuba Center's cultivated areas are nearly 600 acres of beautiful natural lands with native forests, wetlands, and open fields. The staff have surveyed these areas and have located colonies of *Tipularia discolor* and *Aplectrum hyemale*. Phil then described the growing media and fertilization regimes he uses for growing orchids at the Center, and he offered to share this information by e-mail with those who are interested.

Kip Knudson then presented an update on the activities of the Native Orchid Conference Conservation Committee. Kip discussed the goal and the specific objectives of the NOCCC [these were published in an article in NOCJ 4(1)]. An updated version of the long-term studies protocol was also discussed. This document is available through the NOC website. Another document describing the role of NOC in guiding long-term studies also has been posted on the web. A discussion of the NOC commitment to 1% FOC (1% For Orchid Conservation) pursued and a request was made to the NOC Board for discussing the matter further. The Conservation Committee also is working on creating a pamphlet which outlines the steps for protecting and preserving areas which harbor native orchids. Finally, Kip informed all that a 'Source-List' has been developed which lists the businesses supplying cultivated native orchids. While a first draft of the pamphlet was distributed at the conference, suggestions were made for adding a disclaimer to the effect that the businesses listed therein have verbally assured NOCCC that they only supply seed-grown orchids. Also, if a business is not listed in the NOCCC Source-List, it does not imply that it does not supply seed-grown orchids.

Chuck McCartney from Hollywood, Florida was the next speaker who shared information on the 'Tropical Terrestrial Orchids of South Florida.' He defined 'tropical orchids' as those which grow below the Tropic of Cancer. He mentioned that *Calopogon* spp., for example, cannot be considered tropical. He then showed pictures of and discussed several terrestrial orchids of south Florida including, *Beloglottis costaricensis*, *Sacoila lanceolata*, *Eltroplectris calcarata*, and *Pelexia adnata*. Chuck also mentioned some non-native terrestrial orchids which occur in south Florida: *Spathoglottis plicata*, *Oeceoclades maculata*, *Zeuxine strateumatica*, and *Eulophia alta*.

The first day of meetings was concluded with the Annual Business Meeting of the Native Orchid Conference, Inc. Lorne Heshka presided over this meeting and first, Joan Heshka read the minutes from the 2006 annual meeting which were accepted. The budget for 2006 was presented by Lorne Heshka and was accepted subsequently. Discounted rates for student membership ($15/student) and conference registration (33% off the full cost per student) were established in 2006, and it was agreed that the organization should advertize the reduced fees more widely to attract students to the organization. Further, David McAdoo is to organize a Scholarship Committee to administer a $1000 scholarship to support student research on native orchids. Bob Sprague agreed to serve as Chair to the Publicity Committee and will appoint members to it. Journal Publication Committee then presented a report by reviewing the publication process. It was mentioned that the number of color pages in the Journal has been increased recently and the response from the membership was very enthusiastic. The Conservation Committee's report followed and the members

were informed of the North American Source List mentioned above. The Native Orchid Conference, Inc. Board approved the proposal to participate in the '1% For Orchid Conservation' Program. New Business for the membership was discussed and Hal Horwitz informed the audience that he had created a "Manual for Hosting an Annual Native Orchid Conference Meeting" for consideration by the Board. The document is to be reviewed by the Board and those who have in the past organized NOC meetings. Lorne Heshka then presented the preliminary results of a survey he had distributed within the membership; he is to summarize all responses to present the summary report to the Board for review. Finally, the venue for the meeting in 2008 was discussed. Scott Shriver offered to assist in hosting a meeting in Virginia/Pennsylvania area, Ben Rostron proposed a meeting in Edmonton, Alberta, Kip Knudson proposed one in Wisconsin, while Phil Oyerly proposed Mt. Cuba in Delaware as a potential location. The Board, after reviewing the proposals, agreed to select Virginia/Pennsylvania as the venue for the next annual meeting in July 2008. The membership was then advised that the minutes of all NOC meetings are open to all members for viewing at the NOC Yahoo Website. Finally, the Nominating Committee proceeded with nominating individuals to fill the positions which had become vacant. The new treasurer for the organization is Christine Fleissner, who replaced Mark Rose. A replacement for one of the members-at-large, Shirley Curtis, is now Mark Larocque.

On Sunday, 15 April, Mike Owen, Biologist for Fakahatchee Strand Preserve State Park in Collier County, Florida started the day by talking about the 'History of the Fakahatchee and its Orchids.' Mike labeled the park as the 'fountain of youth' for himself and described the 85,000 acre state park as an elongated linear feature. Geologically, the area is at least ~6000 years old. It is 19 miles long and 3-5 miles wide and 3-5 feet deep. He then labeled it the 'orchid and bromeliad capital of the US.' Logging was still conducted in the park until about 6 years after WWII. Mike documents the numbers and species of plants in the park. The goal at the park is to achieve the historical hydroperiod. Fire is also used to manage the vegetation at the park.

Ron Coleman then presented a talk on the 'Orchids of the West,' which provided a nice change of pace from the discussions of Florida orchids. He started out by redefining the West to be able to include some showy species in the presentation. West Texas (Big Bend area) was considered part of the 'West' for this talk. He pointed out that the water table in Arizona, for example, was 2000 ft. below the surface as opposed to only a few feet below surface in Florida. Ron showed pictures of and described *Dichromanthus cinnabarinus* and several species of *Hexalectris*, including *Hexalectris revoluta*. *Epipactis gigantea* was shown growing on wet ledges of the sandstone canyons of New Mexico. This species needs a more-or-less constant flow of water. The audiences were delighted to see some excellent photographs of *Cypripedium parviflorum* var. *pubescens* and *Cypripedium parviflorum* var. *makasin.* Other

orchids shown included *Cephlanthera austiniiae* and *Corallorhiza mertinsiana.*

Jimi Sadle, Park Biologist, Big Cypress National Preserve within the Everglades National Park talked about the 'Orchids of the Big Cypress National Preserve.' There are 38 species of orchids within the preserve and several invasive species such as, *Schinus terebinthifolius* (Brazilian pepper), *Lygodium palmatum* (climbing fern), and *Melaleuca quinquenervia* (melaleuca). The different habitats within the preserve include hammocks, strands, and pinelands. The northern pinelands, he said, are sandier and harbor *Calopogon multiflorus*, and *Spiranthes* spp. *Sacoila lanceolata* var. *pallidicola* also occurs here along with *Maxillaria crassifolia* and *Dendrophylax lindenii*.

Next, Scott Stewart, Ph.D. student at the University of Florida presented a report on 'Orchid Conservation in South Florida: A joint report from the University of Florida and USFWS,' and talked about the need for integrated conservation for orchids. He mentioned that ecology, morphology, propagation, pollination, education, and politics all should be considered during orchid conservation. A tissue culture laboratory was constructed at the Florida Panther Wildlife Refuge as part of the effort. Some of the orchids the group is studying are *Eulophia alta*, *Bletia purpurea*, and *Cyrtopodium punctatum*.

Ben Rostron from the Department of Earth and Atmospheric Science, University of Alberta, next discussed the topic 'Groundwater and (Alberta) Orchids: A link.' Ben is a hydrogeologist who wished to present his observations and sought feedback from others on whether they had observed or documented similar phenomena. Ben suggested 4 groups of orchids based on the hydrological features of a habitat. Group I occurred in Direct Groundwater Recharge areas and includes *Amerorchis rotundifolia* and the *Platanthera dilitata* complex. Group II in wet/moist environments included *Platanthera orbiculata*, the *Platanthera hyperborea* complex, *Listera cordata*, *Malaxis paludosa*, and *Malaxis brachypoda*. Group III is based on rapidly draining relatively dry environments which harbor *Corallorhiza maculata*, *Goodyera repens*, *Goodyera oblongifolia*, *Cypripedium acaule*, and *Calypso bulbosa*. Group IV is designated for species which do not exhibit a specific preference. He ended his presentation by stressing the need to consider the relationship between the hydrology of a habitat and the orchids which occur therein.

Russ Clussman was the final speaker at the conference and discussed 'South Florida Native Orchid Overview.' Russ showed the images of many of the species of orchids which occur in South Florida, including *Tolumnia bahamensis*, *Vanilla mexicana*, and *Sacoila lanceolata.* Russ also showed the photographs of orchids the participants could expect to see during the field trips.

The formal portion of the NOC ended with unanimous consent that we had

conducted another successful meeting. Those that could not make the field trips departed pledging to see everyone at the conference in 2008. Surely, as Lorne mentioned when opening the conference, seeing our orchid friends is as exciting as seeing the orchids. Well, almost as exciting, at least.

A First Hand Account of the Scheduled Field Trips of the 6th Annual NOC Meeting

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The first field trip of the Native Orchid Conference was on Monday, 16 April, 2007. A cold front (cold for southern Florida) had just whipped through the night before, and left us with remarkably cool, clear, and low-humidity weather. We met in the parking lot in front of the office of the Fakahatchee Strand State Preserve at 9:30 am, after having carpooled and driven a glorious 70 miles west along the Tamiami Trail (Hwy. 41) from our various motels in South Miami. This State preserve is a part of the larger Big Cypress Swamp. Along the way, we all marveled at the bromeliads in full bloom on the trees along the roadside. This was our first clue that we were in for a special treat.

At our gathering point, we were briefly given field trip instructions and divided into two groups in order to lessen the impact on the swamp. Our first stop was along the main road leading from the Park office into the Strand. Let me take this opportunity to provide a definition of "strand" from the Florida State Parks website located at (http://abfla.com/parks/FakahatcheeStrand/fakahatchee.html):

> The Big Cypress Swamp of southwest Florida is basically a flat, gently sloping limestone plain. During the rainy season (June through September), water flows slowly southward over this plain into the mangrove swamps bordering the Gulf of Mexico. Water also flows below ground through the porous underlying limestone. In places, limestone has dissolved, forming elongated sloughs or channels, which have accumulated deep organic soils. These channels or sloughs have been colonized by cypress and other trees, creating swamp forests that stand out on the horizon in contrast to the open prairies and pinelands that occupy the sterile veneer of marl soil, which is on top of the remaining limestone. The local term for these linear swamps is "strand."

We emptied out of our cars and proceeded directly into the swamp, following

our eminent leader, Mike Owen. Mike, the State Biologist for the Fakahatchee Preserve, had previously given us a wonderful program on the Fakahatchee, and was generous to a flaw in seeing that we had the best possible leader to lead us on our trek.

When we first crossed a water-filled ditch and entered the darkness of the swamp, I noticed trepidation on the faces of some of the participants, but it quickly vanished when we saw our first orchid plant, *Vanilla phaeantha*, or leafy vanilla. This curious plant snakes its way up the side of a tree as high as thirty feet or more. As it climbs, it zigzags back and forth, producing a bright green leaf at each zigzag. Sometimes, at the height of twenty or more feet, it will produce a cluster of buds, which bloom in succession, each bloom lasting only a single day. Unfortunately, the only flower we saw was a withered flower that had bloomed the previous day, as well as a group of about a dozen seed pods produced on a single bloom stalk of another plant. That was the first of many *Vanilla* plants we would see that day. These appeared to be quite plentiful in this particular location.

A non-orchid plant abundant at that location is *Peperomia obtusifolia* or Florida peperomia. It was in seed at the time with slender, cylindrical seed spikes about six inches tall and a quarter-inch wide. In addition, we saw many different species of bromeliads (air plants) growing in the branches and on the trunks of many of the surrounding trees. The most impressive of these is *Tillandsia utriculata*, or giant air plant. Unfortunately, it is being decimated by an exotic weevil that bores into the heart of the growing plant, laying eggs that hatch out and feed on the soft tissue, thereby killing it. We saw a number of these giant air plants that appeared to be doing well (for now) as well as several dead ones.

The last orchid I saw in bloom at this location was *Epidendrum anceps*, or dingy-flowered star orchid. This beautiful orchid has been misnamed, in my opinion, because it produces a tight cluster of lovely, butterscotch-colored flowers at the end of the bloom stem.

After returning to our cars, we stopped once more just down the road to study and photograph *Bletia purpurea*, or the terrestrial, pine-pink orchid, which was growing beside the road. Oddly enough, all of the common, pinkish purple ones were not in bloom that day, but we did find the rare white form whose flowers were just beginning to open. Fortunate, indeed!

As we resumed our automobile caravan, we all anticipated the final stop – the tramway spurs branching off at periodic intervals from the main road. These tramways are actually raised roadbeds on which small trains or trams were operated to aid in removing the forest products (mainly cypress) that were harvested from the swamps in the immediate area. Again, we were split into two groups – each one exploring a separate tramway. Our group was assigned to K-

12 tram. The hike along the tram seemed to last forever, but it was only about two miles long. It did provide us a chance to chat along the way, and make some new friends. At the end of the hike, we had arrived at a small cabin in the swamp. Behind the cabin was a large pond, which we soon discovered was full (we counted at least fifty) of alligators. When they saw us, they all began to swim in our direction. They looked hungry and fidgety, so we didn't go for a swim, although the cool water was inviting.

Our field trip leader had recently visited this particular site, and led us down the path about one hundred yards past the cabin to an area where he promised to show us *Ionopsis utricularioides*, or the delicate ionopsis orchid. At first, we saw only a couple of straggly plants hanging by a few thread-like roots (which is their preference, it seems). After a bit more searching, we found a single tree with at least three dozen plants, one of which was in full bloom. Unfortunately, I couldn't adequately photograph it, since it was on a limb twenty feet above my head, and I did not have a long lens with me. With a bit of additional searching, we found another, smaller tree just up the canal that was providing the habitat for a dozen more plants, two of which were in spike. This was remarkable, since the total park survey for this plant, to date, was around three hundred plants!

At this point in time, some of us were beginning to feel fatigued, and decided to return back to base and forgo the second tram trek. I understand that I missed photographing, among other non-flowering orchid plants, *Dendrophylax lindenii*, the ghost orchid. I also understand it was not in bloom, but it would have been interesting to see the web of leafless roots that radiate from a single point on the trunk of a pop ash or pond apple tree, both common to the strand.

For the second field trip to the Everglades National Park on Tuesday, 17 April 2007, the day broke clear and dry – the weather being very conducive for getting out into the wild. We made a short trip from our motels in Homestead to meet at 9:00 am at the Ernest F. Coe Visitor Center parking lot (just inside the park) where we, again, were divided into two groups. Each group would end up visiting the same areas, but the smaller numbers of participants on each trek would cause less impact on the fragile habitat.

Our first stop was in an area known as Coot Bay, about twenty miles into the park from the visitor center. When we arrived at this site, we gathered in a single group and headed off for unknown territory (at least to the uninitiated). Almost immediately, we met our first obstacle, which was a deep and smelly canal about ten feet across. Fortunately, someone had provided a 2" x 8" board on which we were to balance ourselves as we teetered across, arms askew, cameras swinging, curses muffled, prayers uttered, until we reached a huge, seemingly impenetrable, tangled mass of mangrove roots. Somehow, we were

supposed to climb over/under/around this maze of roots to reach solid ground. Amazingly, we managed, and didn't loose a single soul along the way – at least we haven't missed them yet…

Once we were out of this jungle of limbs, roots, and foliage, we were greeted by the sight of an open field (prairie) that stretched for as far as the eye could see. The prairie was bordered on both sides by large button-wood and cypress trees, which, we would soon see, provided shelter for some of the most beautiful orchids we would see this day. We were told that the now empty prairie had been the home of many large button-wood trees until a hurricane and subsequent wild fire had cleared it clean of anything but the low-growing and succulent *Batis maritima*, or saltwort. When crushed, it is said to be a remedy for venereal disease – although I doubt that any of our esteemed crew would have needed to use it for such a purpose.

The first orchid plant that was pointed out to me was *Encyclia tampensis*, or Florida butterfly orchid. As luck would have it, it was not in bloom – maybe next trip. The next orchid plant I saw was *Prosthechea boothiana*, or Florida dollar orchid – named for the round, silver dollar shape of its pseudobulbs. Many of the plants we saw of this species were in seed, and the capsules were quite interesting – triangular in cross-section and hanging down, weighted with thousands of seeds.

Then, it was time for the big show. As we rounded the corner (actually the narrow foot path didn't have corners, but we did make some sharp, sometimes awkward turns – some of us loosing our dignity on our way to the soggy ground), our senses were literally assaulted with the sight of a large button-wood tree loaded with flowering *Cyrtopodium punctatum*, or cowhorn orchid plants. It is easy to see how this orchid got its common name, since its pseudobulbs are shaped like horns. Another name is cigar orchid. This particular button-wood tree contained at least nine, very large, mature plants, each producing several four- to five-foot flower spikes loaded with hundreds of mahogany-spotted yellow orange flowers in perfect bloom! How else can I describe the sight except by saying that I was awestruck! Not only did we see the myriad flowers, but also on one stem there were two, pendulous, fist-sized seed capsules, spilling out many of the dust-like seeds at the slightest breeze.

Most of us lingered for quite a while at this site, taking many photographs and uttering senseless remarks, while some of the other more seasoned participants struck out for sights unseen. Having been convinced (I still don't know how) to plod on for bigger and better quarry, we slogged off (by now ankle deep in water) around another proverbial corner of the path.

Lo and behold! in short time, we were confronted by yet another fantastic sight – another large button-wood tree, this time providing habitat for the fabled

Trichocentrum maculatum, or spotted mule-ear orchid. If it was possible to upstage the previous tree full of orchids, this came very close. Here was a huge plant with many wide, leathery leaves at least three feet long growing in the crotch of the tree. To top it off, the plant had produced about eight, four- to six-foot spikes of dark red-spotted, yellow orange flowers, similar to but different in shape from the previous *Cyrtopodium punctatum.* If I hadn't been told the common name for this spectacular species, it would probably have been my first guess – the leaves were remarkably similar to the ears of a mule.

We were told by one of the more knowledgeable in the group, that this species is being attacked by an insect that bores into the plant and eventually kills it. Subsequently, we saw several large plants that were completely dead and withered – sadly, victims of this dreaded invader. Researchers have placed experimental netting over some of the smaller, easier-to-reach, plants in order to study them and their insect invader more closely.

By this time, most of us were experiencing sensual overload, having picked up our chins from the ground on several spellbinding occasions. The day was lengthening, and we still had a few more stops to make, so we headed back to our cars. On the way back, one of our group, Saul Friess, a valued expert and longtime resident of the area, cornered the participants around the now-fabled "*Cyrtopodium* tree" and took a couple of group shots of us for posterity.

After successfully navigating the mangrove maze and smelly canal one more time, we paused for lunch, and then headed off to our next stop – a cypress hammock that we had previously passed on the way to Coot Bay. When we reached the cypress hammock and vacated our automobiles, we were greeted with the members of the other group rounding the bend behind a large group of cypress trees. They had big smiles on their faces and were stuttering and stammering about having seen large orchid plants in full bloom on the cypress knees in the hammock. Little did they know what was awaiting them at Coot Bay!

We had been told that we would be getting our feet wet on these field trips, but up to this point, that had not really materialized. There has been a mini drought in the area, and the usual water-filled sloughs were relatively dry, at least up to this point. Now, it was time to get wet. This is what we had been expecting all along. In no time, we were up to our knees (thighs for the shorter participants) in the cool, clear water that surrounded the cypress trunks and knees. The water was so clear, that you could easily see aquatic plants growing out of the ooze a couple of feet underwater.

Upon entering this cathedral of cypress trees, we immediately began to see more *Encyclia tampensis*, growing on the cypress knees. They were scattered here and there along with thousands of bromeliads sending up their bright red

flower spikes.

It was not long before our trip leader spotted several *Cyrtopodium punctatum* plants in full bloom. These were not quite as large as the ones we had previously seen at Coot Bay, but they had an edge on those other plants – they were all at eye level or lower – making it much easier to photograph them. We were just beginning to enjoy the cool water around our legs and feet when someone said, "Snake over here!" That's one of those things that makes you go "Hmmmm…" It turned out to be a four-foot, poisonous, cottonmouth water moccasin, which was sunning itself on a partially submerged log. Several of us intrepid (probably due to being out in the sun too long) explorers got close enough to it to get a photograph or two, before leaving it to hunt another day. There ensued a lively discussion of whether or not that species could bite underwater. None of us were willing to test out the prevailing hypothesis, though. Shortly after that, we carefully slogged our way back to our cars, occasionally looking over our shoulders for any slithering creatures that we may have overlooked.

The next stop was near Royal Palm Hammock where, after a short walk into the woods, we were treated to the sight of a couple of huge, terrestrial *Oncidium floridanum*, or Florida oncidium orchid plants. Again, these were not yet in bloom, but the amazing thing about them was their eight- to nine-foot flower spikes. One can only imagine the host of bright yellow flowers that will be produced in a month or so from these exceptional plants. We were told that this particular area had suffered from a severe drought several years ago, and was almost totally destroyed from subsequent wildfires that season. A few, scattered, remnants of the hammock had managed to survive, harboring these rare plants. Hopefully, they will be able to produce seed for future generations.

The last stop was one I was looking forward to from the first day I had arrived in Miami. We were taken to a clay marl (a calcareous clay, or impure fine grained limestone) area that was just a short drive from the visitor center from which we originally departed. This clay marl area was rather desolate looking, and seemed to be the general habitat for miles and miles of marsh grass. However, we were told that it harbored the unusual variety of *Calopogon tuberosus* called variety *simpsonii*. [Aside: Thanks to fellow NOC members who have generously guided me to their favorite *Calopogon* sites, I have had the privilege to photograph all of the other North American *Calopogon* species, and this was the remaining one for me.] After a brief search, we saw one plant, then another. Soon we had found about a half-dozen plants in bloom – all fairly close to the road. The flowers exhibited a wide range of colors from a soft pink (almost white) to the more common magenta topped by a white lip. The defining feature of this *Calopogon* variety, is that the single leaf is narrow and inrolled, clasping the flower stem. It is unusual in one other respect – it prefers a calcareous (basic) habitat, while most of the other *Calopogon* species thrive in

an acid environment. What a fitting end for the trip – to finally check off another species that I could have found in no other place than in this special area of southern Florida.

Many thanks are due to the field trip organizers and leaders. There are too many to mention, fearing that I would leave out a name by error. Their pre-conference scouting aided in our seeing more plants than we could have possibly hoped for otherwise. Their keen eye and deep knowledge of the subject was invaluable in showing us a great time in one of the premier orchid locations of North America. I take this time to send you a warm and gracious "Thank You!" from all of us.

A Brief Review of Pollination and Fruiting Success in *Cypripedium fasciculatum* Kellogg ex S. Watson (Clustered lady's-slipper)

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Orchid flowers and their pollinators provide many examples of highly specialized relationships. The plants are often fertile across species and even generic boundaries, and selection for reproductive isolation has led to the evolution of novel floral morphologies and pollinator behaviors. Biologists have devoted much effort to untangling the interactions between these flowers and their pollen vectors. The most devious orchids are those that produce no nectar or any other floral rewards, employing instead some method of deceit. This group includes the lady's-slippers, where field and laboratory studies have now disclosed much about the pollination process, the breeding system, and the factors that limit or otherwise influence fruiting success.

A recently studied example is *Cypripedium fasciculatum* Kellogg ex S. Watson, the rare clustered lady's-slipper. Native to the northwestern United States, *C. fasciculatum* is a small terrestrial orchid of cool, seasonally dry mountain slopes or moist stream terraces, where it occurs on various substrates, often in partially to fully shaded coniferous forest. Small isolated populations are scattered at elevations of 0-3200 meters from Washington to northern California and east in the mountains to Idaho, Montana, Wyoming, Utah, and Colorado (Brownell and Catling, 1987; Sheviak, 2002).

Photos to accompany ‘Summary of the 6th Annual NOC Meeting’ by Jyotsna Sharma and Ron Coleman (page 1).

Photos to accompany 'Summary of the 6th Annual NOC Meeting' by Jyotsna Sharma and Ron Coleman (page 1).


Calopogon multiflorus
Photo: Lorne Heshka

Photos to accompany 'Summary of the 6th Annual NOC Meeting' by Jyotsna Sharma and Ron Coleman (page 1).


Sacoila lanceolata
Photo: Lorne Heshka

Photos to accompany 'A First Hand Account of the Scheduled Field Trips of the 6th Annual NOC Meeting' by Jim Fowler (page 6). Above and below: A cypress hammock in south Florida. Photos by Jim Fowler.

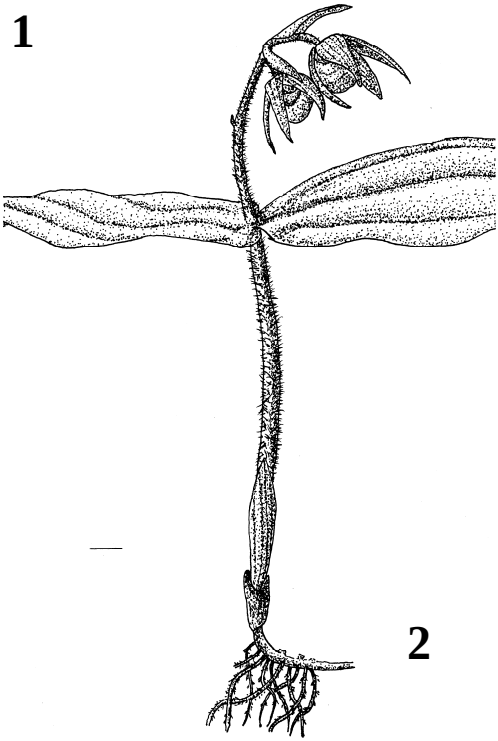
Photos to accompany 'A First Hand Account of the Scheduled Field Trips of the 6th Annual NOC Meeting' by Jim Fowler (page 6). Above: Whole plant of *Cyrtopodium punctatum*. Below: close-up of flowers of *Cyrtopodium punctatum* and of *Trichocentrum maculatum*. Photos by Jim Fowler.

Cyrtopodium punctatum

Trichocentrum maculatum

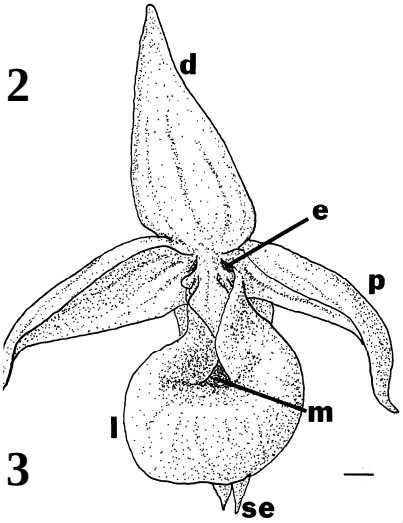
Photos to accompany 'A First Hand Account of the Scheduled Field Trips of the 6th Annual NOC Meeting' by Jim Fowler (page 6). Above: *Vanilla phaeantha* growing on the trunk of a tree. Photos by Jim Fowler.

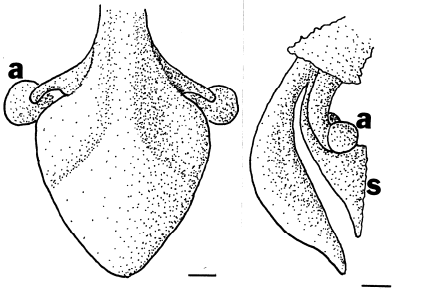
Photos to accompany 'A First Hand Account of the Scheduled Field Trips of the 6th Annual NOC Meeting' by Jim Fowler (page 6). Above: Alligators (by the dozen!) at Fakahatchee Strand State Preserve. Below: Cottonmouth water moccasin resting on a log in the Everglades National Park. Photos by Jim Fowler.



Figures 1-4 from 'A Brief Review of Pollination and Fruiting Success in *Cypripedium fasciculatum* Kellogg ex S. Watson (Clustered lady's-slipper)' by Charles Argue (page 12). Abbreviations: a – anther, d – dorsal sepal, e – exit hole, l – labellum, p – lateral petal, se – lateral sepal, m – mouth, s - stigma.

1. Whole plant of Cypripedium fasciculatum . Bar = 1 cm.
2. Flower with erect dorsal sepal. Bar = 1.5 mm.
3. Column, top view. Bar = 0.5 mm.
4. Column, side view. Bar = 0.5 mm.





The semi-trap blossom

The flowers of *C. fasciculatum* are not showy. A short rhizome produces 2-10 clustered aerial stems, each up to 25 cm tall with 1-7 musky-smelling, small flowers closely spaced in a short arching to nodding raceme (Figure 1; page 20). Flowering begins in the spring or early summer depending on elevation and aspect. All the flowers of an inflorescence open in less than a week, and individual flowers are usually receptive for over two weeks. The sepals and lateral petals vary in color from purple-brown to yellowish-green and are lined with darker, brownish-purple veins. The lateral sepals are fused almost to their tips while the dorsal sepal arches over a nearly spherical, dull yellow-green lip (slipper or labellum) mottled with red to purple markings, especially around its mouth (Figure 2; page 20) (e.g., Luer, 1975; Brownell and Catling, 1987; Coleman, 1995; Sheviak, 2002; Ferguson, Donham, and Brown, 2005).

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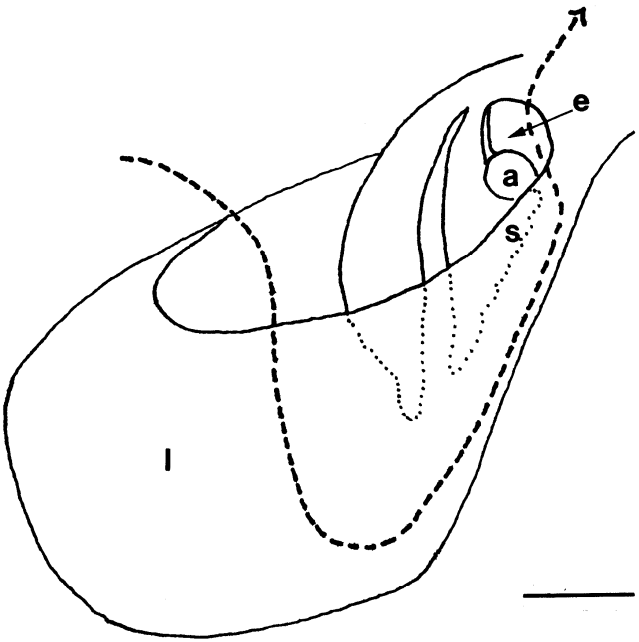

Figure 5. Diagrammatic longitudinal section of flower with dotted line showing direction of pollinator movement. Bar = 2 mm. Abbreviations: a – anther, e – exit hole, l – labellum, s - stigma.

This lip plays a critical role in pollination. Lady's-slippers have flowers of a type known as trap or semi-trap blossoms. They temporarily imprison their insect pollinators and force them to follow a prescribed sequence of behaviors in order to obtain their release. An insect of the appropriate size enters the lip through the obvious large opening at its top (Figures 2, 5; pages 20 and 21, respectively). The slippery inner surface and the in-folded margins usually prevent it from leaving by the same route. Even though insects have been reported to sometimes chew through the wall tissue, most find a different way out. A foothold is provided by tightly packed, long hairs (trichomes) on the bottom of the lip. These lead along a pathway toward escape holes at the base or heel of the slipper (Figures 2, 5; pages 20 and 21, respectively).

In its escape the pollinator must pass two points where the passageway is narrowed. At the first of these it is forced to squeeze under and rub its back against the surface of the stigma (Figure 4, 5; pages 20 and 21, respectively). The second narrow passage is the exit hole itself. One exit hole is located on either side of the base of the flower (Figures 2 - 5; pages 20 and 21). An anther is so positioned beside each exit that an insect of the proper size cannot force its way out without contacting the anther and carrying away a mass of sticky pollen on its back. Since the vector contacts the stigma before the anther and usually does not reverse directions, it does not ordinarily transfer pollen to the stigma of the same flower. Rather, pollination is accomplished when and if the insect, upon escaping from the first flower, is subsequently trapped again, usually in a different flower, and the escape procedure is repeated (e.g., Stoutamire, 1967).

Biologists are uncertain just why insects enter the flowers in the first place. In some cases the entry is inadvertent. The insects, exploring the outer surface of the lip, tumble into the trap. In other cases entry appears quite deliberate. Some authors contend that insects may collect oil from the hairs on the inside of the lip. This has yet to be confirmed. It has also been conjectured that small amounts of nectar are present or that the insects feed on the hairs in the labellum. But it now appears likely that the flower provides no reward, and the insects are simply deceived by false nectar guides and the color and odor of the blossoms, which promise nectar or other enticements where none is available (e.g., Nilsson, 1981, and references therein).

<u>What pollinates the Clustered Lady's-Slipper?</u>

Among species of lady's-slippers reproductive isolation is related, in part, to the size of the flower. More specifically, the width of the entrance and especially the diameter of the anther exit holes and the space between the labellar floor and the stigma determine the size of the insect involved in the pollination. The dorsal-ventral thickness of the insect's thorax may be of critical importance. In addition, Nilsson (1981) noted that the depth of the labellum in *C. calceolus* L. (the Eurasian yellow lady's-slipper) must exceed the length of the

pollinating insect by a minimum of 3 to 4 mm or the insect can simply crawl back out through the labellar opening. All of these floral characters are clearly under strong selection pressure in relation to the primary pollen vectors. In *C. fasciculatum*, the anther exit holes are only 2 mm in diameter, and the opening to the labellum is about 7 mm wide (Knecht, 1996). Pollinator size is accordingly restricted.

Recent studies in southwest Oregon identified the pollinator in this area as a tiny (3-4 mm long) parasitic diapriid wasp in the genus *Cinetus* (Ferguson and Donham, 1999; Ferguson, Donham, and Brown, 2005). Peak activity of this yet to be identified species occurred during anthesis of *C. fasciculatum*, and female specimens were collected carrying pollen smears of the orchid on their backs. In one case, the insect was captured emerging from the exit hole at the base of the labellum (Ferguson and Donham, 1999; Lipow, Bernhardt, and Vance, 2002; Ferguson, Donham, and Brown, 2005).

Although Ferguson and Donham (1999) initially thought that dark-winged fungus gnats (Sciaridae and some Mycelophilidae), found in close association with *C. fasciculatum* and implicated as pollen vectors of other orchids (Mesler, Ackerman, and Lu, 1980), might play a role, they now regard *Cinetus* females as the exclusive pollinators of *C. fasciculatum* in their study area (Ferguson, Donham, and Brown, 2005). The larvae or pupae of the fungus gnats serve as hosts for diapriid larvae (e.g., Gauld and Bolton, 1988). Ferguson, Donham, and Brown (2005) believe that the flower of *C. fasciculatum* may produce an odor that mimics that of the fungus gnats and that this may prompt the female diapriids to enter the labellum in search of their larval hosts.

Ferguson (pers. comm. 2004) has now monitored additional populations of *C. fasciculatum* in California, Colorado, and Wyoming. Unidentified diapriids show up at all these sites, even though none have, as yet, been found carrying orchid pollen.

Breeding system and fruit set

Studies of the breeding system in *C. fasciculatum* revealed that the experimental transfer of pollen within a single flower (selfing), among flowers in the same raceme (geitonogamy), or between racemes of nonclonal plants (xenogamy or out-crossing) all produced high levels of fruit set. No fruit was developed when insects were prevented from reaching the flowers, and spontaneous or vectorless self-fertilization (autogamy), and asexual seed production (agamospermy) are absent (Kipping, 1971; Knecht, 1996; Lipow, Bernhardt, and Vance, 2002; Ferguson, Donham, and Brown, 2005).

Moreover, there was no reduction in fruit set in self-pollinated as compared to cross-pollinated plants (Knecht, 1996; Lipow, Bernhardt, and Vance, 2002). Although the pollination mechanism promotes cross-pollination, *C. fascicula-*

tum reproduces vegetatively, and some transfer of pollen among members of a single clone undoubtedly occurs. A flowering period with many simultaneously open flowers on each plant provides ample opportunity for pollen transfer among flowers of the same raceme or among racemes of the same clone. Nonetheless, genetic studies of chemical variation within and between populations imply that the primary mode of reproduction is out-crossing (Aagaard, Richy, and Shea, 1999). Either pollination within populations is primarily random or survival of the products of selfing is reduced by some means such as a depression of seed viability (Aagaard, Richy, and Shea, 1999; Lipow, Bernhardt, and Vance, 2002).

The levels of natural fruit set in the clustered lady's-slipper are highly variable. Greenlee (1997) found that a population of this species in Montana's Bitterroot Mountains averaged 0.72 fruits from 2.55 flowers per flowering plant. Knecht (1996) reported that an average of 32% of flowers produced capsules in nine small populations in Washington's Wenatchee Mountains, and Kipping (1971) found 47% of the flowers produced fruit at a site in Nevada County, California. Lipow, Bernhardt, and Vance (2002) recorded levels of fruit set varying from 18% in the White River National Forest of Colorado and 29% in the Nez Perce National Forest of Idaho to 69% in the Siskiyou National Forest of southwestern Oregon. Ferguson, Donham, and Brown (2005) also recorded 56% fruit production from southwestern Oregon, although heavy predation and reduced pollinator activity lowered this level to 13% and 17% in succeeding years.

What limits reproductive success?

Fruiting success (female fitness) can be limited by a number of factors including pollinator visitation rates and the quantity of resources available for allocation to capsule and seed maturation. In orchids requiring an external pollinator, low levels of pollinator availability or activity may be indicated in carefully controlled studies by a significant increase in fruit set among flowers that are artificially hand pollinated compared to those that are left to be pollinated naturally (open pollinated). Lipow, Bernhardt, and Vance (2002) demonstrated such a response in experimentally cross-pollinated as compared to open pollinated flowers in their Colorado and Idaho populations. They conducted no hand pollination experiments in Idaho, but in Colorado self-pollination produced a significant increase in fruit set when compared to open pollination. In each case all flowers on plants of the experimental group received pollen, thus avoiding a shunting of resources from unpollinated to hand pollinated flowers. Knecht (1996) also observed significantly higher levels of fruit set in hand pollinated compared to open pollinated flowers at her study site in east-central Washington. Hand pollinations were not carried out on the Oregon populations, but the high levels of natural fruit set observed in some years suggests that fecundity here might not always be limited by pollinator visitation rates.

Although more than a one or two season investigation is needed to establish whether pollinators are limiting (Primack, 1996; Primack and Stacy, 1998), the pattern noted by Lipow, Bernhardt, and Vance in Colorado and Idaho and Knecht in Washington has been frequently reported in other orchids that rely on deception. Possible adaptation to pollinator limitation in *C. fasciculatum* might be further reflected in an observed decrease in fruit set associated with a reduction in pollinator numbers due to fire (Knecht, 1996), in synchronous flowering at a time when other species are not in flower (Latham, 1999), and in the long receptivity of the flowers, which maximizes their opportunity for pollination (Primack, 1985; Gregg, 1991; Neiland and Wilcock, 1998).

Lipow, Bernhardt, and Vance (2002) noted that pollination rates were negatively related to population size: the level of fruit set at the Oregon site, where the population was small, greatly exceeded that at the Colorado site, where the population was much larger and denser. A similar inverse relationship is common in other species with non-rewarding pollination systems (Ackerman 1981, 1986; Fritz and Nilsson, 1984; Agren, 1996). Presumably, training of the pollinator to the appearance of non-rewarding flowers is more intense and more rapid in larger, denser orchid populations (Lipow, Bernhardt, and Vance, 2002).

At the same time, the probability of a given flower producing fruit was not related to the number of flowers present in the inflorescence (Lipow, Bernhardt, and Vance, 2002). However, the size of the inflorescence was positively correlated with plant size, and larger plants, with a larger number of flowers, had a higher absolute probability of producing fruit and had more resources to devote to fruit development.

A larger number of flowers in a primarily outcrossing, hermaphroditic species such as *C. fasciculatum* might also improve reproductive success through an increase in pollen donation (male fitness). Hermaphroditic flowers that produce fruit may contribute to both male and female success, whereas those that produce no fruit can contribute only to male success (e.g., Sutherland and Delph, 1984). If the allocation of resources to “extra” flowers (i.e., those that do not produce fruit) increases male fitness, through pollen donation, more than it diminishes female fitness, through reduction in fruit maturation, the production of “excess” flowers should be selected (e.g., Sutherland, 1986, 1987, and references therein). Also, in years when conditions are exceptionally good and pollinators and resources are sufficient, pollination of some of the “extra” flowers should increase the number of seeds produced by each plant and in equilibrium with resource availability, contribute to an improvement in the seed quality of heterozygous species, such as *C. fasciculatum*, through the selective abortion of inferior stock (e.g., Calvo and Horvitz, 1990: Neiland and Wilcock, 1998, and references therein).

The occurrence of unpollinated ("excess") flowers could, of course, also be attributed to pollinator limitation. Many authors view pollinator limitation as evolutionarily unstable, however, and believe that various strategies to increase pollination success should be favored and should spread through the population (e.g., Haig and Westoby, 1988; Gill, 1989; Neiland and Wilcock, 1998). In addition to an increase in flower number, these might include a shift to asexual seed production or a modification in floral anatomy that would allow autogamy (spontaneous self-fertilization) to occur in this already self-compatible species (Gill, 1989). However, a transition to asexual seed production is uncommon in orchids and according to Neiland and Wilcock (1998, and references therein), may be inhibited because development of the embryo sac and placental cells is often delayed until pollen has been deposited on the stigma. The shift to spontaneous self-pollination, although not unknown in *Cypripedium*, is also difficult because it requires significant morphological changes in the structure of the flower.

An alternate possibility is that flowers could develop which provide a nectar reward. This might reverse the negative reinforcement of repeated visitor behavior in non-rewarding flowers. Although the presence or the artificial addition of nectar does not always mitigate pollinator limitation, it had a significant effect on both pollen removal and fruit set in *C. acaule* Aiton (pink lady's-slipper) (Cochran, 1986). Neiland and Wilcock (1998) reported that average fruit-set figures measuring the relative reproductive success of nectarless and nectar producing orchids in North America were 19.5% and 49.3%, respectively, based on fruit to flower ratios. These authors believe the adoption of nectar production might represent the most effective mechanism for overcoming the reproductive restrictions of pollinator limitation.

Data based on hand pollinations suggest, however, that such increased fruit production in many deceptive species could limit the resources available for subsequent growth, reproduction, and survival (e.g., Primack, 1996; Primack and Stacy, 1998, and references therein). Therefore, even though fruit production within seasons may be pollinator limited, an increase in pollination rate might not significantly improve overall reproductive success because such an increase could have an adverse effect on lifetime fecundity.

Resource and pollinator limitation have different evolutionary implications. A limitation of resources leads to competition among plants for male success and consequent selection on traits that influence the dispersal of pollen. A limitation of pollen leads to selection on traits that enhance pollen receipt (Johnston 1991a, b). According to Haig and Westoby (1988), theory predicts that the effect of these opposing selective forces should produce a balance between resource and pollinator limitation. An equilibrium would be expected to evolve as an evolutionarily stable strategy with individuals experiencing temporary yearly shifts in the balance to accommodate changes in environmental factors.

However, the theoretical predictions are not supported by empirical studies which frequently demonstrate that seed production is pollen limited, sometimes severely.

Cochran (1986), for example, found the effects of resource limitation on overall reproductive success in *C. acaule* to be subordinate to pollinator limitation. Based on his data, two years of complete pollination would be equivalent to ten to twenty years of normal fruit set, and long life spans and low mortality would, in time, permit resource-depleted individuals to resume reproduction. Primack (1996) observed such recovery in several Massachusetts populations of *C. acaule*. In *C. fasciculatum* individuals routinely survive more than 30 years (Lipow, Bernhardt, and Vance, 2002), and some records indicate life spans of over 90 years (Niehaus, 1974), although emergence and flowering can be sporadic (Harrod, 1994; see also Gill, 1989; Light and MacConaill, 1990, 1991).

Calvo and Horvitz (1990) also consider the costs of reproduction to be secondary to pollinator limitation. According to their demographic model, the control of average plant fitness involves more than a simple dichotomy between costs of reproduction and pollination levels. Increased pollination might, for example, achieve increased fruit set with little or no increase in cost up to some threshold level. Experimental treatments that involve hand pollination of all or most flowers on a plant may artificially increase fruit set to extreme limits. Although maximizing reproduction in favorable years appears to be a selected strategy in many plants where pollination is uncertain, experimental hand pollinations may exceed the normal range of natural fruit set and may have no significance in relation to the natural ecology of the species. Studies of reproduction in the orchid *Tolumnia variegata* (Sw.) Braem were consistent with these predictions (Calvo, 1993). A statistically significant reduction in future growth and flowering was observed only in plants subjected to a high pollination intensity treatment (viz., all the flowers in the inflorescence were pollinated resulting in a mean fruit set about 88 times greater than in open pollinated plants). Simulations revealed that the production of only a few seedlings per fruit could more than compensate the cost of fruiting and that therefore selection for higher levels of pollination should be favored.

Calvo (1993) believes that the low level of pollination and fruit production frequently observed in orchids lacking spontaneous self-pollination may be due to a low correlation between fruit or seed production and seedling establishment. Selection for increased levels of pollination would be ineffectively low if an increase in seed production was not translated into an increase in the number of reproductive individuals produced in the next generation (i.e. an increase in fitness). Under such circumstances pollinator limitation might be evolutionarily stable (Calvo, 1993).

Knecht (1996) reported both pollinator limitation and poor seedling recruitment in *C. fasciculatum* at her study site in east-central Washington. Plants produced an average of about 4,300 seeds per capsule, but few were able to establish. Aagaard, Richy, and Shea (1999) speculate that seedlings of this orchid may only become established in the earliest stages of forest succession. The clusters of plants now observed occupying mid- to late-successional stages may represent asexually generated descendents persisting through the production of rhizomatous clones, the apparently separate plants derived by dieback or fragmentation of a branching rhizome. This growth habit and the probable long life span of *C. fasciculatum* might permit some plants to survive a series of successional stages until suitable habitat for the establishment of seedlings becomes available (Knecht, 1996; Aagaard, Richy, and Shea, 1999). If so, management to provide early successional habitat would be required for the development of new colonies and the long-term survival of the orchid.

The early succession hypothesis is interesting, but as Aagaard, Richy, and Shea (1999) point out, additional studies are needed to clearly detail how new populations are established and to distinguish between clone members and seedlings in plant clusters sampled from a range of successional stages. Preliminary DNA investigations now suggest that plants more than a few centimeters apart can differ genetically and may be derived from seeds (Liston pers. comm. in Severs and Lang, 1998). Moreover, early successional communities may lack the fungal symbiont(s) necessary for the establishment and early survival of this species (Harrod, 1994).

Additional studies are also needed on diapriid wasps. The reasons for the variation in natural fruit set (18% - 69%) are uncertain, at least in part because diapriid wasp behavior is not understood. Many species of *Cinetus* and other diapriids remain undescribed. The identification and study of individual species and an understanding of their role in the pollination of this orchid across its range must await the construction of a new key to this group, a task that has only recently been initiated at the Smithsonian (Ferguson, personal comm. 2004). Once the baseline data are gathered, scientists will be able to provide land managers with better information on which to base decisions affecting the long term survival of this remarkable little orchid.

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It was a pleasure meeting with our many friends from across North America and Europe for the 7th Annual Meeting of Native Orchid Conference Inc. in Florida. For those of you who were unable to come - we missed you. Thanks to David McAdoo and Mark Rose, we were once again treated to an excellent conference. For those of us who have never previously searched for orchids in Florida, the field trips to the Fakahatchee Strand and the Everglades provided us with an experience we shall not soon forget. Rubbing shoulders with alligators and cotton-mouths was exhilarating!!

In response to suggestions received from previous conferences, our annual business meeting was held early in the conference. At this meeting, several new thrusts for the organization were introduced. These should provide more visibility to our organization and will ensure that we continue to progress. Kip Knudsen and his Conservation Committee have been very active and have created a list of native orchid vendors who provide a supply of seed-grown native

orchids to the public. Their recommendation of the adoption of "1% for Orchid Conservation" is an indication of their determination to make Conservation a vital aspect of NOC. Bob Sprague has agreed to chair the newly formed Publicity Committee, and has already taken significant strides in developing a Publicity policy to ensure that our organization becomes well known in the orchid community. His success in featuring North American Native Orchids (and NOC) at the South Eastern Pennsylvania Orchid Society Show at Longwood Gardens in April, was a giant step in this direction. Hal Horowitz and his committee, have developed a Manual for hosting an Annual Meeting. For those who agree to host an annual meeting in the future - this document will be an excellent guide. Thanks to all of the individuals who have worked so diligently on these committees.

Calopogon tuberosus var. *simpsonii*

A special thanks to Jyotsna Sharma, Ron and Jan Coleman, and George Johnson for providing us with an excellent Journal and thanks to all who have made the journal a reality by contributing articles and photographs. The selection and quality of articles and photographs continues to improve and the addition of an extra four pages of color has raised the standard of the journal to a new level.

I would like to extend my appreciation to all of the members of the Board, and Committee Chairs, who continue to serve our organization with fore-site and dedication. Thank-you to Treasurer - Mark Rose and Member-at-Large - Shirley Curtis, who have fulfilled their terms, and welcome to Christine Fleissner and Mark Laroque, who have replaced them.
As a final word, I would urge each of you, if you have not already done so, to please complete a membership survey. This is your organization and we need your opinion on what is going well, as well as what we can do better.

Respectfully,
Lorne Heshka, President, Native Orchid Conference Inc.

END NOTES

NOC, Inc. 2008 Annual Meeting!

Appalachian West Virginia & Pennsylvania
18-21 July, 2008

Our 7th annual conference is to be held at West Virginia University (WVU) in Morgantown, WV - the heart of Appalachia. WVU is located about one hour south of Pittsburgh, PA and is a fantastic, modern facility complete with all the amenities necessary for conference purposes.

WVU is situated at the center of the upper portion of the Ohio River drainage basin which is home to 60 species, 4 varieties, and 3 hybrid native or naturalized orchids. Conference field trips should provide participants with the opportunity to see at least 20 orchid species including more than a dozen which will be in bloom at the time of the conference.

The conference schedule will include an initial day of meetings or presentations on Friday the 18th followed by an all-day field trip on Saturday the 19th into the low mountains of southern and central Pennsylvania. Orchids to be expected in bloom on this trip include:

> *Epipactis helleborine, Goodyera pubescens, Goodyera tesselata, Gymnandeniopsis clavellata (Platanthera clavellata), Listera smallii, Malaxis unifolia, Platanthera ciliaris, Platanthera peramoena,* and *Spiranthes lacera* var. *lacera*

We will rest-up from our orchid outing as we resume presentations on Sunday the 20th and will finish the conference with a final day afield on Monday the 21st. This trip will be into the Appalachian Mountains of east central West Virginia where we will visit the world famous Cranberry Glades Botanical Area. Participants will likely observe the following orchids in bloom:

> *Corallorhiza bentleyi, Corallorhiza maculata* var. *maculata, Goodyera pubescens, Goodyera repens* var. *ophioides, Gymnandeniopsis clavellata (Platanthera clavellata), Platanthera ciliaris, Platanthera grandiflora* (-a new, unnamed variety/species), and *Platanthera peramoena*

Other updates on the 2008 Conference will be announced shortly via the Journal and the NOC website (http://tech.groups.yahoo.com/group/NativeOrchidConference/).

The Native Orchid Conference, Inc.
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Web Site: http://groups.yahoo.com/group/nativeorchidconference/

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⇒ Contributing authors can request up to 2 free copies of the Journal at the time their article is accepted. Copies requested at a later date or requests for additional copies will be charged at $5.00 each.

⇒ Back-issues are available in limited quantities. Each issue may be purchased for $5.00 while supplies last.

⇒ Inquiries concerning orders for back-issues of this journal should be addressed to the Treasurer: Mark Rose, NOC, Inc., P.O. Box 29010, Greensboro, North Carolina 27429-9010, USA; nativeorchids@yahoo.com OR ncorchid@yahoo.com.