Minutes of the Rare Plant Forum
Saturday, March 24, 2007
French Creek State Park

Members present: Jim Bissell, Tim Block, Lucy Boyce, Tim Draude, Janet Ebert, Chris Firestone, Rocky Gleason, Steve Grund, Chris Hardy, Jack Holt, Bonnie Isaac, Joe Isaac, Joan King, Larry Klotz, John Kunsman, Carol Loeffler, Darlene Madarish, Rick Mellon, Sarah Miller, Susan Munch, Janet Novak, Stephanie Perles, Barry Poglein, Autumn Sabo, Loree Speedy, Steve Stein, Christopher Tracey, Kathy Tyson, Norman E Tyson, Jeannine Vannais, Jeffrey Wagner, and Deanna Witman

The meeting convened at about 10 AM.

Introduction and Announcements.
Steve Grund introduced the meeting. The Rare Plant Forum, which is a subcommittee of the Vascular Plant Technical Committee, meets annually to discuss and recommend changes to the Plant Species of Special Concern in Pennsylvania or POSCIP list. The recommendations are passed to the Vascular Plant Technical Committee, which approves and forwards them to Chris Firestone of the Bureau of Forestry. Steve noted that the weight of our expertise generally means that all of our recommendations are accepted by BOF, and Chris Firestone agreed that in the package of changes that she is currently putting through the state legislature, all recommendations of VPTC are accepted. Once the changes make it through the legislative process, they become official.

Steve noted that there are a relatively small number of proposals this year, but there are also some good presentations. He invited Rare Plant Forum members to also stay for the first part of the Vascular Plant Technical Committee meeting (which follows the rpf meeting), because Jeannine Vannais would be giving a presentation on Bowman Hill Wildflower Preserve's use of PSI (Plant Stewardship Index) and the potential for extending its use to the whole state.

Steve Grund also announced that there are several openings in the Natural Heritage Program. They are seasonal and full-time, mostly in western Pennsylvania, for botanists and ecologists. Interested folks should talk to Rocky Gleason or check the website for the Heritage Program. Most of the people working for the Heritage Program are employees of the Western Pennsylvania Conservancy, although some (such as Chris Firestone) are employees of the Department of Conservation and Natural Resources.

Larry Klotz reported that he is organizing this year's joint meeting of the Philadelphia Botanical Club and Torrey Botanical Club, which will be held June 17-21 in West Virginia. Field trips will head to Dolly Sods and the Canaan Valley. He has sent notices to the Philadelphia Botanical Club, the Muhlenberg Botanical Club, the Pennsylvania Native Plant Society, and other organizations and the information is all on the Philadelphia Botanical Club website. The total cost per person is $250.

Tim Block announced that the second edition of *Plants of Pennsylvania* will be out in May.

Jim Bissell announced a conference, for which he passed out a brochure.

Steve Grund noted that the Tysons had brought several copies of a book on *Sirex* wood wasps and that there was information on where to get it if we ran out.

Chris Firestone reported on a new book, *Ferns and Fern Allies of Pennsylvania.* One can google on that name and purchase it off a web site.

Chris Firestone went on to announce that there will be two Wild Resource Festivals this year. On June 9, there will be one at French Creek State Park, and they have asked grant recipients to go. On May 12, there will be one at Moraine State Park, featuring live raptors, reptiles, insects, and more along with bird banding, wildlife walks, telemetry demonstrations, sampling of wild edibles, and hands-on learning activities. The idea is to bring the public in and give them a chance to talk to researchers.

Chris also announced a weeds calendar, an online calendar on invasive plants that one can download, and noted plans to do an online calendar on natives for 2008.

Chris Firestone next reported that the Bureau of Forestry has one nursery left (Penn Nursery, on Rt. 322). Historically, they grow trees and some non-native plants for landowners. The new manager, Tina Alden, is converting their efforts to native plants, and she has a wish list of seeds that she would like to get. Chris has edited the list, and she passed it around to see if any of us might have some of them.

Emerald ash borer, Chris Firestone noted, continues to head toward Pennsylvania, so seeds of all ash species are of interest (for growing seedlings after the ash borer has worked its way through the state).

Susan Munch announced that she had copies available of her book on mosses and liverworts of Pennsylvania.

Additional announcements were made right after lunch (see below).

Pollination Biology Research and Rare Plant Conservation. Steven J. Stein, who lives in Arizona but who has been here in Pennsylvania at Mansfield University in north-central Pennsylvania, gave a presentation entitled “The relative IMPACT of floral visitors. A continuum from very harmful parasites to very beneficial mutualists.” Harmful parasites are those that suck nectar without effecting pollination, the worst being those that destroy flower parts. The most beneficial mutualists are those that bring lots of the right kind of pollen. Steve’s work was mostly done in Costa Rica, but he promised tie-ins to recent research in Pennsylvania.

In Costa Rica, Steve Stein worked on a tropical milkweed, a forest gap species that now is often seen in agricultural fields and along roadsides. It is clonal. It produces pollinia, each consisting of two sacs connected by a strand, with 60-80 pollen grains per sac. There are five such pollinia per flower. These dry out on the flying insect, and in drying they twist such that they can fit into the receptacle of the female part of the flower (all of which makes self pollination unlikely). A pollinator's leg structure and its exact behavior on the flower determine how much pollen it picks up.

Many groups of insects, even cockroaches and ants, visit the flowers and suck nectar. Both visitation rate and the amount of pollen removed per visit contribute to the amount of pollination achieved, and seed set is the ultimate measure of a given insect species' value as a pollinator.

Pollinators recorded in the 2.5 month study included (among others):

BBW	Big black wasp
BWB	Black and white wasp
BAWW	Brown abdomen and wings wasp
BB	Little black bee
HB	Hesperid butterfly
BF	Black fly

Steve Stein reported that monarch butterflies never suck nectar from milkweed. Ants do suck nectar but they never collected pollen in his study. Hummingbirds can suck nectar without getting near the pollinaria.

Relative visitation rates to milkweed flowers were highest among wasps in the study. Bees made half as many visits, and butterflies and flies visited at low rates. Rates varied considerably among species, however (for example, the big black wasp visited less often than other wasps and even some bees and flies. Black and white wasps visited the most often.

To study efficiency in pollen removal, Steve organized a bunch of flowers with exactly five pollinaria (they removed flowers that had already been pollinated). They then recorded the number of pollinaria removed by each visiting insect. At the extremes, the brown abdomen and wings wasp removed a mean of two pollinaria for every visit, whereas the black fly did not pick up any pollinaria (making it a worthless visitor).

Insects were also captured and examined for the number of pollinaria that they were actually carrying. Big black wasps carried the most (averaging eight at a time), whereas brown abdomen and wings wasps carried an average of four pollinaria and were sometimes observed eating or attempting to shake the pollinaria off. Other types of pollinators carried lower average numbers of pollinaria.

The relative efficiency of delivery of pollinaria was measured by tallying the number of pollinaria deposited per visit. Here, big black wasps deposited the most per visit,

whereas the black bee never delivered, and joined the black fly on the worthless visitors list. Other pollinators were in between.

The relative effectiveness of pollinators was calculated by determining the total number of pollinaria delivered over the life of the inflorescence. Big black wasps made only 0.2 visits per day per inflorescence, but they were most valuable in the end because they carried and delivered a lot more pollinaria. The brown abdomen and wing wasp was second in relative effectiveness, and the black and white wasp was a strong third although it only accounted for half as much pollen delivery as the brown abdomen and wing wasp. Two more pollinators including the hesperiid delivered very few pollinaria over the life of the inflorescence, and all other pollinators were of zero value. Steve concluded that the deposition of pollen requires long legs and movement into the flower.

An important conclusion from this study is that visitation rates can be very misleading. They are much harder to study on other plants. One has to put the pollinators in alcohol, get the pollen off, and quantify the grains microscopically.

Steve Stein noted the Catch 22 faced by rare plants: generalist pollinators tend not to service such plants, so they rely on specialist pollinators, which are rare.

In response to a question on how important pollination is to clonal plants, Steve said that it is not as important as for non-clonal plants, but it is important for genetic diversity.

John Kunsman asked if one finds the same pollinators in field vs. forest, and Steve said that the relative importance of different pollinator species does change with habitat.

Steve Grund said that insect individuals may spend a day on a species, but is there a problem with plants being overwhelmed by pollen from other species? Steve Stein confirmed that an insect individual may specialize for a day or for its life, depending on the availability of flowers. Milkweeds *(Asclepias)* have a lot of nectar. But to encourage particular pollinators, one may need to plant additional host plants and build nesting structures.

Steve Stein then discussed his recent work in Pennsylvania, with common milkweed, *Asclepias syriaca.* He is finding similar things, except that honeybees are too common. It would be neat to do the research on a rare plant. Jack Holt suggested doing it on a rare *Asclepias.* This brought up the problem of getting enough populations of a rare plant, but Steve Grund observed that PNDI (the Pennsylvania Natural Diversity Index) could be a source of population information, and one can get neighboting states' data.

Proposals to update the POSCIP list.

Erigenia bulbosa. Currently listed as PT, on both the official state list and the PABS list. (The PABS list is VPTC's recommendations to the Bureau of Forestry. The state list is periodically updated to match the PABS list.) This species was proposed now for

delisting by Jim Bissell. Jim explained that on some streams, this species occurs literally everywhere you look. He listed several places. Its habitat includes marsh and floodplain forests – very common habitat. Joe Isaac added that in Greene County it occurs in every watershed, often in big populations, of greater than 1,000 individuals.

Janet Ebert asked if this species was increasing in number or if it had been missed before. Jim Bissell said probably both: it may have been missed in marshes because it is an early season species, and it may be spreading. Jack Holt said that he hasn't seen it on the Susquehanna. Steve Grund said that it occurs on Friendship Hill, one of the few good habitats on the Monongahela River, where he found a population of 20,000. It likes the edges of trails and its dispersal may be aided by humans (or deer, as someone suggested). Steve Grund continued that it tends to be in nice sites, but in disturbed parts of them. It was fruiting in July where Steve saw it, although it more normally fruits in early to mid-June. Fruit bends it over, and other vegetation then hides it. Jim Bissell said that he has found it in cutover areas. Janet Ebert asked if there was stiltgrass at those sites. Steve said yes but not where the *Erigenia* is. The stiltgrass could become a big problem. Jack Holt asked what trees were in that habitat. Jim Bissell said sumac, bitternut hickory, red ash, and silver maple, and Steve Grund added that it can also occur up on hills in a variety of forest types.

John Kunsman said that he admires Jim but that he would like the species to remain on the list so as to give eastern populations some protection. Discussion of the need to protect those populations followed. Rocky Gleason agreed that there needs to be some differentiation between the Allegheny and Susquehanna drainages. There are only four populations total in the eastern part of the state, and John argued for the value of preserving populations across the whole range. But Steve Grund observed that he would worry that we would have a huge list of species to track if we did that. Chris Harding asked about its history in eastern Pennsylvania. Jeff Wagner said that we need to link it to habitat status, as one should with *Collinsia verna*. Steve Grund said that he would like to know if the eastern populations are disjunct from the rest of the distribution. John Kunsman said that it is S3 in Maryland, and we may have the only Susquehanna records. It is PE in New York. He thinks the populations there are in western New York. It is more common to the west, in Ohio. Steve Grund said that this would be an example where one could make good use of the Special Populations category, because the rare eastern populations may be the only ones in their watershed.

Larry Klotz observed that it seems important to determine if the western populations are spreading. Steve Grund said that that is hard to assess for *Erigenia*, unless someone was doing plots at an earlier time. Jim Bissell said however that he has seen new populations established, and it may indeed be spreading. Darlene Madarish said that when she surveyed a spot, the population of *Erigenia bulbosa* was low because of the flood history of the site, and she noted that one has to take that factor into account.

Jeff Wagner asked for a summary of population numbers. John Kunsman said that there are 37 total extant populations, four in the east, as of Friday (the day before this meeting). Joe Isaac said that reports on most of his populations have been sent in and should have

been processed by now. But there should be five more to add that he hadn't sent yet. Loree Speedy mentioned recently collecting more plants and extending the size of a population in a multiflora rose seep. As for number of individuals, estimates on record are in the tens of thousands. Jim Bissell said that it occurs all along floodplains. He has seen it in some pretty beat-up sites. Jeff Wagner noted that it is very drainage-specific. Rocky Gleason noted that political boundaries (i.e., the state boundaries of Pennsylvania) are not natural boundaries, and in the future we should consider drainages. Steve Grund agreed that that would be the ideal, but if we have a real disjuncture that isn't just an artifact of state lines, then we could go with a Special Populations designation. He asked if this situation is such, given that we know what is happening to *Erigenia bulbosa* in neighboring states. (It was also mentioned at this point that both West Virginia and New York have online atlases of their plant species.)

Steve Grund also asked if we should protect the species statewide, after all this discussion. Jim Bissell said that it is secure in one part of the state (the west), and he asked if the eastern populations are stable. John Kunsman said that the three on power company land are fairly well protected. One population is on private land.

Regarding drainage distribution and disjunction, Jack Holt noted that he thinks Pennsylvania populations are an extension of a tongue from Potomac populations.

John Kunsman asked if whether, to protect local special populations, a species needs to have a state rank. He noted that the definitions of Pennsylvania Endangered and Pennsylvania Threatened are about likelihood of extirpation, whereas the definition of Pennsylvania Rare affords opportunity to protect local populations that are significant for genetic and other reasons. Both John Kunsman and Chris Firestone noted that there is in fact provision in the Act for this situation, in the definition of PR. Chris Firestone went on to note that we can keep eastern records in the database for environmental review and not keep the western ones. Autumn Sabo agreed that she thinks we need to keep *Erigenia bulbosa* on the list at a rank of PR, but that we should only track the eastern populations. In answer to a question, Autumn added that we only track natural populations of *Ilex opaca* (American holly), not all populations.

Steve Grund tried out a couple of counterexamples, species that vary in abundance across the state that we haven't listed, on the group: gray birch and *Trillium grandiflorum.* John Kunsman replied that gray birch is successional and doesn't need protection. In contrast, we should be protecting *Trillium grandiflorum.* Steve Grund said that we have a policy issue here which perhaps should go to the Vascular Plant Technical Committee. John Kunsman protested, saying that the list is used for other things besides environmental review; for example, putting species in the PR list can be a signal to local conservancies that we think that the plant is special in this area. Steve Grund argued that if there are too many species on the list as PR, DEP might not protect them, and that the messages to local conservancies could be sent via Heritage rankings. John Kunsman replied that no one cares about Heritage ranks, but if people see a plant on the state list, they take note.

Chris Harding asked if there is another category that we could use besides PR. The answer was no. Deanna Witman observed that DEP may or may not back up permitting for PR species. To have true protection, a species needs at least a PT designation. Janet Ebert agreed that the only way that PR species get protected is through good faith. Chris Firestone said that actually even PE and PT species only get protected through good faith; the law has no teeth except through the DEP permitting process.

Jeff Wagner asked if *Erigenia bulbosa* fell within PR guidelines, since it seems to have more than the maximum 100,000 individuals but it does have fewer than 50 recorded populations. Steve Grund said that it is in the area where we need to be watching trends. He asked if the Bureau of Forestry would see a problem if we listed *Erigenia bulbosa* as PR. Autumn Sabo reiterated that we can arrange things so that it is listed as PR but western populations are not tracked, and we can educate people when questions come up. Jeff Wagner then asked if we can live with it being listed as PR given that the number of individuals is so high. Steve Grund suggested that we list it as PR now, with environmental review restricted to eastern Pennsylvania, and with instructions to VPTC to consider the general issue. Jim Bissell approved that idea. Steve Grund said that if we didn't have consensus on this, we would send it to the VPTC. Jim Bissell said that we've listed a lot of species in the past with similar circumstances. Steve Grund asked the group if we have consensus. Rocky Gleason noted that we have the capacity to add a column, to track or not to track, to the database and that we could do this for a lot of taxa. Chris Firestone noted that we don't have any special populations listed in the regulations right now, in the regulations package that they are working on. The special populations issue has however come up before. Rick Mellon asked how this could be; don't we do special populations for *Ilex opaca.* Chris Firestone said that she hasn't seen *Ilex opaca* showing up on anything that says Special Populations. Steve Grund said that we should refer the issue to the VPTC. Bonnie Isaac then asked if Special Populations is used for *Elodea canadensis,* which had a male population discovered in Lehigh County in 1994. No one had an immediate answer. It was noted that the VPTC should also look into other species that have been delisted because of being common at one end of the state.

Tim Block asked if we should do nothing now, not change *Erigenia bulbosa's* status to PR, given that we might end up changing its status again at the VPTC meeting in the fall. Janet Ebert agreed that too many changes erodes our credibility. However, Jeff Wagner argued that recommending PR status now actually made for an easier progression over the summer. We decided, finally, to recommend PR status but to advise the Bureau of Forestry to use discretion in environmental review because it is the expressed opinion of the committee that in western Pennsylvania it needs no protection.

→ PR but western PA populations need no protection

Samolus parviflorus. Officially listed as TU, listed by PABS as PT, but now proposed for deletion by Jim Bissell. Jim Bissell explained that this species is common in western Pennsylvania and he is confident that there is a lot more out there. It occurs on floodplain embankments, on shores of pools and lakes, and in riverine marshes. It even persists

where canary grass is coming in. It forms seed banks well and germinates when the water level is down. Jim said that he sees it everywhere that he looks.

Jack Holt and Janet Ebert reported that it is in the eastern part of the state as well. John Kunsman said that he didn't check on it but he believes that it presents the same situation as *Erigenia bulbosa.* Deanna Witman noted that it has very variable population sizes from year to year. Jim Bissell said that there are two reasonable populations in Bucks County: one in the hundreds, and another between 50 and 60 individuals. It is an annual, however. Steve Grund asked what pollinates it. Jack Holt said tadpoles. John Kunsman reported that there is one population in Juniata County and one in Franklin County, along with the two populations in Bucks County. Deanna Witman said that actually there is another population to report in Bucks County, making three there.

Steve Grund asked if making the species PR would be appropriate. Tim Block agreed with John that it seemed to present the same issue as *Erigenia bulbosa.* Jeff Wagner said no, because the number of individuals is lower for *Samolus parviflorus,* and we're relying more on projections. Autumn Sabo noted that in the southeast, there are 12 historic populations but only three of them are still extant. Jack Holt noted that the tidal area where it grows is "trashed." Steve Grund opined that making decisions based on projections should be fine – in fact, we need to project – as long as the projections are based on good information. Jim Bissell repeated that any time he goes to a site that could have it, he sees it.

Steve Grund suggested taking a hard look at the numbers. There are 18 to 20 extant sites documented. How confident are we that there are more than 50? Jim Bissell said that he was confident that there were more than 50. It is not as abundant on lakeshores as on floodplains and muddy embankments. Tim Block noted that it presents the opposite situation in the east: there is lots of habitat but one doesn't see it. Deanna Witman reported that she could not find it in a ten-mile survey, which surprised her. Jack Holt said that he is sure that we've lost lots of habitat in the southeast, and he added that it is a difficult plant to spot. Steve Grund summarized that it has declined in the southeast, whereas in the northwest Jim Bissell has found that it's obviously been overlooked. Jack Holt observed that he thinks that *Samolus parviflorus* is more in trouble in the eastern part of the state than *Erigenia bulbosa* is. Janet Novack suggested that if there are only 18 to 20 sites documented, we should leave the species on the list until we have 40 populations documented. This stimulated some discussion on use of botanists' time to document sites with collections (which takes time) when we know already with confidence that there are lots of sites out there. Jeff Wagner noted that it should be at our discretion whether we use documentation or projection of population numbers and sizes.

Integrating the eastern vs. western observations, we decided to recommend PR status.

→ PR

Lunch Break

Post-lunch announcements. Chris Firestone reminded us that applications for WRCF grants are due on June 30. The application form is online at the Wild Resource Conservation Program website. She encouraged us to apply; there is funding available for good proposals, especially those geared toward conservation of native plants.

Chris Firestone also reported that Autumn Sabo and Ellen Shultebager are now permanent employees of the Bureau of Forestry and are doing BOF reviews. Emilee Boyer and Rebecca Bowen, both undergoing training with Autumn, are the new contacts for environmental review. BOF is interviewing for a part time environmental review position, 20-32 hours per week, this coming week, and we should apply today if interested.

Continuing with proposed changes to the POSCIP list

Eupatorium godfreyanum* and *Eupatorium album* var. *vaseyi. Currently not on the official state list but on the PABS list as UEF (tentatively undetermined, possibly endangered, needing fieldwork). Steve Grund made a tentative proposal to delete this species based on the possibility that it doesn't occur in Pennsylvania. The *Flora of North America* shows *Eupatorium album* var. *vaseyi* in Pennsylvania but not *E. godfreyanum.* The proposal was tentative because Steve wanted to check several things at the Academy of Natural Sciences in Philadelphia, and he did that yesterday. As he had suspected, the type specimen is from Kentucky, not Pennsylvania, and is not at the Academy. Using a key from Cronquist, however, Steve determined that the specimens that are at the Academy are *E. godfreyanum*, and none were *E. album* var. *vaseyi*. So we seem to be correctly tracking *E. godreyanum* after all.

Steve Grund's altered proposal was to leave *E. godfreyanum* at PT while leaving *E. album* var. *vaseyi* off the list (in other words, no change).

Discussion followed on why the species are so difficult. The fellow from Kentucky who wrote the *FNA* treatment is still working on these species and has trouble with them. The *FNA* treatment does show *vaseyi* occurring in Pennsylvania. It is a complex of apomictic hybrids. The seed is fertile and the hybrids are stable, acting like species. Indeed *Eupatorium* species tend to be apomictic and polyploidy, so the genus is difficult. The most useful key, according to Steve Grund, is Cronquist's in *Brittonia* vol. 7 (1985), pp. 237-242.

There are very few populations of *E. godfreyanum* in Pennsylvania, so Steve Grund had thought that he might propose upgrading it to PE status, but John Kunsman had told him that some populations go for miles and it tolerates roadsides, all suggesting that the threat of extirpation isn't great enough to justify PE status. John thought it should be PR. John mentioned now that it occurs at highly disturbed sites, such as Fort Indiantown Gap. Lebanon County records didn't make it to the *FNA* map. All five Kunsman specimens that Steve examined at the Academy looked like *E. godfreyanum* along with all

specimens that said *vaseyi.* He did not have time to look at all of the *E. rotundifolium* specimens there yesterday, but it is possible that some of them are *E. godfreyanum.*

Steve Grund's abundance estimates are at least three, more likely five to ten sites (maybe as many as 20), and at least 3,000 but more likely 6,000-12,000 individuals (possibly as many as 25,000). It is, he said, rare but not really habitat specific, and it seems to be competing well with invasive species in the area.

Jack Holt asked John Kunsman if John thought that there was a lot more habitat out there. John said that he thought there was. Steve Grund said that he is not sure if we have all of the historic populations for *E. godfreyanum* in the PNDI database. There were a lot of labels at the Academy, and he did agree that the *E. rotundifolium* specimens there should be checked.

There was additional discussion of how sure we were of the taxonomy; Steve said that he was 90% sure that we have *godfreyanum,* not *vaseyi,* and that he was 75% sure that we have *rotundifolium* in Pennsylvania although he thought probably not all of the specimens that we have for *rotundifolium* actually are *rotundifolium.* Steve said that he was comfortable himself with a PT designation as far as population size was concerned. Jack Holt noted that a site at Coatesville is about to be developed. Autumn Sabo said that a portion of that site is to be set aside, and they feel that some of the population will survive.

***E. godfreyanum* remains PT; *E. album* var. *vaseyi* remains off the list**

Boltonia montana. Currently not listed but proposed for either PX or UXF status by Steve Grund. This species is newly described, in a paper published in *Cida* last year. It appears to be quite rare globally, being known only from a Virginia river shore, a Virginia vernal pond, and a historic occurrence along the Susquehanna. Someone remarked that it is also extant in New Jersey, based on a dot on the map near Delaware, but this remark went by too fast for the minutes secretary to double-check at the time.

Its occurrence in a vernal pond in Virginia suggests that we may want to check vernal ponds along the Susquehanna, perhaps even more than areas along the river itself. The historic site is in Dauphin County, however, and Rocky Gleason noted that he can't think of vernal ponds in the area. Chris Firestone suggested the Stony Mountain area. Larry Klotz said that he had not had opportunity to check the vernal ponds in the area. The historic site specimen label actually says "bank of the Susquehanna River," but John Kunsman said that he would estimate the probability of it being along the river now as low. The best chance of finding it, he thought, is in other habitats, particularly in vernal ponds higher up in the mountains.

Steve Grund suggested PX or UXF status on the grounds that we don't have a category equivalent to the Heritage Program's SH category. An advantage of using PX in this case is that if it turns up, its status would immediately become PE.

John Kunsman noted that if Sue Thompson were here, she would favor PX status based on the 50 year rule.

Rick Mellon noted that this species would not be overlooked if it is present. John Kunsman disagreed, saying that one could walk by and not spot it if it were not flowering and if the pond was heavily vegetated. The distinguishing characteristic is the seed's pappus, as described in the *Sida* paper.

Tim Block asked if we are absolutely comfortable with this as a good species. He noted that he is always concerned when a new species is proposed in the Asteraceae. Someone also noted that we do have *Boltonia asteroides* in Pennsylvania, which is PE.

Steve Grund suggested that the creative solution would be to designate it UXFT, tentatively undetermined, probably extirpated, needing both fieldwork and taxonomic work. If plants are discovered, we would consider them *Boltonia asteroides* pending taxonomic clarification, and they would receive protection under *B. asteroides'* PE designation, which seems appropriate because if *B. montana* is a good species and is found in Pennsylvania, it too will merit that level of protection.

Chris Firestone urged at this point that we table the proposal and discuss it at the Vascular Plant Technical Committee meeting in the fall. This was agreed.

-> Tabled, referred to VPTC

Carex roanensis. Currently not listed but proposed for PE status by Steve Grund. This species, Steve explained, was thought restricted to Roan Mountain, Grandfather Mountain, and the surrounding area, but it was then found in more places. A graduate student (Tyler) then looked for the species in herbaria and found some specimens from West Virginia and one from Ohiopyle in the West Virginia herbarium. It was then found extant at Ohiopyle. Steve Grund then checked specimens at Carnegie and found a duplicate of the Ohiopyle collection as well as a specimen from Potter County. The peryginia in the specimens are hairy, so they are not *C. astibilis;* and they are too drawn out to be *C. virescens.* (The specimens were in the *virescens* folder.) Tyler thinks that there is nothing else the specimens can be, besides *C. roanensis.* Steve noted that the *Flora of North America* puts these species in different groups, but Tyler is moving them into the same group. The Potter County specimen is from the northwest part of that county, and Tyler says that we had better look in New York now. It is globally rare and Tyler is recommending G3 status. Steve's estimated number of extant occurrences in Pennsylvania is at least three, most likely five to ten, and possibly up to 30, all containing a minimum of 50 genets but more likely 75-200 genets (possibly 2,000 genets if there are some undiscovered sites out there).

Jack Holt wondered if we knew enough about it or should consider TU status. Steve Grund asked if we didn't know enough to warrant environmental protection, in which case we really should go with PE or PT status. He has reviewed all of the possible

specimens at Carnegie, where most western Pennsylvania collections are, but he hasn't looked at the Philadelphia Academy of Natural Sciences or Penn State collections yet. Nonetheless, even if other stations turn up, this is not a dirt common species. Autumn worried that Steve was making a lot of extrapolation, but Steve said that he is confident that there are not a lot of *astibilus* and *viridescens* specimens in those other herbaria that will turn out to be *roanensis,* based on his work so far.

Steve noted that the habitat is not special – just mesic woods.

There was discussion, brought up by Janet Ebert and Jack Holt, of the fact that the most recent issue of *Sida* has another article on a new species, *Carex umbellata.*

Enough uncertainty remained about the status of *C. roanensis* that it was agreed to recommend undetermined status with need for fieldwork and more herbarium work.

→ UEFH

Aristida dichotoma* var. *curtissii. Currently listed as TU (state) and UEF (PABS) but proposed for PE or PT status by Chris Tracey. Chris explained that he has found eight plants in the Sideling Creek Shale Barrens, and he has learned that several other populations have been found. Chris estimated most likely 10-20 sites (at the extremes, 5-25) and at least 12 genets known, likely at least 40.

Steve Grund observed that this is not a tiny plant, but a wiry one, and it can be missed or ignored. It is native to Pennsylvania, occurring in dry shaly areas and in railroad ballast. (The latter type of site should not be worried about in environmental review.) Steve Grund said that he and Chris Firestone had discussed this species, and that there seems to be a high potential that they will find more. Tim Block said that he thinks that it is in a lot of places. Chris Firestone said that it is important to document more sites. Jack Holt said that he has only seen it a couple of times in the last 20 years. It is not a common species, he said, nor increasing a lot.

Chris said that there were eight individuals at the Fulton County site (Sideling Creek), although there were probably more earlier in the year, and that there were no data on the other sites of which he had heard. He estimated six known extant sites and probably several undiscovered.

Jack Holt said that he had no problem with PE status but would want it determined for any given site whether it was native or not.

Steve Grund asked if the species was in grave danger of being extirpated. John Kunsman said no; Rocky Gleason pointed out the need to protect western populations but the lack of need to protect eastern ones. Chris Tracey noted that the dot map from the *Vascular Plants of Pennsylvania* on his proposal did not include recent records from Bedford County. John Kunsman added that there are some in Bucks County where spoil has been

dumped on riverbanks. Shale barren quarrying should not be done, he said, but the railroad populations of this species are adaptable.

Steve Grund suggested a status of PT with the recommendation that the Bureau of Forestry use discretion in whether or not sites come up for environmental review. Non-native sites should not be tracked. Autumn Sabo asked whether or not railroad sites should be considered natural if the plants got there by natural means. Steve agreed that the railroad habitats mimic natural ones and one could think in those terms. Jeff Wagner noted however that even if we include the railroad occurrences, the abundance estimates Chris had entered into the proposal still made the species seem quite rare. (Numerical estimates are in the PE range; occurrence estimates are close to that.) Steve noted that only a small percentage of the available habitat has been searched, and Jeff said that he was more concerned about the validity of extrapolating. Jack Holt said that he was more concerned about the future of the shale barrens. Janet Novack noted that the species is not common anywhere in the state.

Given the low numbers and low number of occurrences in natural habitat and the vulnerability of shale barren habitat, we agreed to a recommendation of PE with special note in the minutes that "John Kunsman was uncomfortable with that". John said that all of this should be pending a discussion of what PR means, since its definition incorporates some of these problematic situations. **→ PE**

Houstonia purpurea. Listed as TU but now proposed for PT status by Steve Grund. Steve said that he went to Terrell's monograph and found that the distinction between varieties *calycosa* and another one get obscured. Steve suggested therefore that we ignore the varieties and simply treat *Houstonia purpurea* as a species. He estimated at least five sites, more likely 8 to 15 (and conceivably as many as 30); and he estimated at least 200, more likely 1,000 to 5,000 individuals (conceivably as many as 20,000, though not likely). The numbers could argue for PE status, but Steve noted that the habitat is such that it could exist where a lot of people aren't looking, and it is tolerant of disturbance. He felt therefore that PT status is appropriate.

Jack Holt said that he thinks any of this group of *Houstonia* taxa is gone from eastern Pennsylvania. The historic records are very old. Tim Draude noted that he hasn't seen it.

We agreed that PT status was appropriate. **→ PT**

Ratibida pinnata. Currently on the state list as TU and on the PABS list as PX; recommended for PE status by Joe Isaac and Loree Speedy who rediscovered it (they believe that they independently found the same occurrence). Steve Grund said that this species is most likely at the very edge of its range. Joe Isaac said that he was not wholly sure of the nativeness of the occurrence, even though the site is where a historic site was. He plans to check five more rumored sites in Beaver County. Steve Grund noted that it gets down to Florida and is not restricted to real prairies. Its persistence suggests

nativeness but it could have escaped from a garden. The number of extant sites is estimated at one (if Joe and Loree found the same one) or two, at minimum, to a likely maximum of four sites and a less likely extreme maximum of about 10 sites. Joe Isaac said that it should not be listed as PX; if it is native, it needs PE status, and if it is an escape, it should be delisted. Steve Grund said that we are not waiting on information at this point. Unless genetic analysis shows that our plants are aligned with distant plants such as those in Kansas, which would imply that our plants are escapes, then nothing is going to happen to give us more ability to determine if our plants are native. They probably are native. Jeff Wagner agreed that it would be worth following up on, but right now our state of knowledge suggests that it should be listed as PE. The group agreed.

→ PE

Taxonomic adjustments to the POSCIP list.

Eupatorium aromaticum. Steve Grund reported that the polyphyletic genus *Eupatorium* needs to be split, based on results of recent phylogenetic studies. The *Flora of North America* and *Plants of Pennsylvania* have adopted the changes. Two species on the POSCIP list are affected, this one and the following. We agreed to recommend the changes.

-> Name change to *Ageratina aromaticum.*

Eupatorium coelestinum. See under *E. aromaticum*, above.

-> Name change to *Conoclinium coelestinum.*

Stachys nuttallii. Steve Grund reported that at a meeting of the International Congress for Botanical Nomenclature, a ruling was made invalidating all of Gilbert's names because he did not consistently use binomial nomenclature. As a result, the name *Stachys nuttalii* has been invalidated and the homonym *S. cordata* becomes the correct name for the species. No one here objected to changing the POSCIP list accordingly.

-> Name change to *Stachys cordata.*

Presentation by Rick Mellon: "Between a Rock and a Hard Place; Plant Habitats Scrutinized." Steve Grund introduced Rick Mellon, noting that he would share his observations on how to effectively use GIS observations in botanical work. There is considerable information available on the physical and geological features of an area that could predict plant communities. Rick is working on a book on these ideas.

Rick said that we classify habitats by hydrological and successional stage, as well as by broader categories such as Coastal Plain vs. Piedmont. But how do plants know where to be? Geology is important, as is topography, which influences rainfall. But the problem for us is that we need predictability in succession; we need to know what plants are going to show up where.

Major concepts that he has developed are as follows:

1) Use a holistic framework; don't predict based on single features

2) Follow the energy, water, and nutrients. If there are six-foot perennials in a given spot, it signals that all three of those resources must be there in good amount.

3) Fuzzy math is useful. There are continuums for everything. For example, Rick noted that Ted Gordon is Mr. Pine Barrens of New Jersey, and he will tell you that pines dominate at a pH below 4.5, whereas spicebush (which is rare in the Pine Barrens) dominates above that level. The abundance of the two species can be graphed along a pH continuum.

4) pH can be used as a surrogate for nutrients. Up to a pH of about 7.5, nutrient levels go up as pH goes up.

For predicting terrestrial plant habitats, the most important determinant is geology, which is generally already mapped and which is stable in time. Soils are also mapped, for agricultural convenience, but they are too broadly defined to be useful so one needs to look at the underlying geology. Farmers can in any case raise the pH of a whole native soil type by liming. (Eventually, such altered soils can drift back to low pH.)

Rick noted that plants don't necessarily occur at one point on the pH spectrum. There are bog and fen specialists that occur at high and low pH but not in between.

There is a relationship of nutrient availability to parent geological material. This relationship is relatively hard to determine with phosphorus, but much easier to see with calcium, nitrogen, and magnesium.

Parent geological materials behave differently despite superficial resemblances. For example, granite and diabase are both hard, but diabase (which shows up in places such as earthquake dikes) erodes much more quickly than granite.

Besides geology, position in the landscape is important. Regular rainfall causes leaching in humid areas, whereas in arid areas evaporation results in nutrients moving up toward the soil surface and pH becoming higher. These situations also develop on the north side of a hill (which has more leaching) vs. on the south side of a hill (which has more evaporation).

Rick turned to some examples:

There is a very small amount of coastal plain in Pennsylvania, a strip along the lower half of the western border of New Jersey. Silver Lake Nature Center, which includes the Delhaas Woods, is in coastal plain (and is surrounded by city). The unique positioning of this site makes it a rich site in POSCIP species.

pH does vary even within the same parent material. Sandstone can have a pH up to 7 or 7.5; the name is based wholly on particle size so rocks of quite different chemistry can be

included. Limestone cement sand, for example, is a very different originating material from quartz sand. Lehighton has some sandstone with a pH of about 7.

Rivers can create differences in the vegetation of a region. For example, the Wading River, which is totally within the Pine Barrens, has cedar swamps. In contrast, the Mullica and Batsto Rivers, which originate outside the Pine Barrens, have more red maple and less white cedar. pH of geological material increases as one goes through a sequence, quartz – granite – gneiss – diabase – serpentine, and the nutrient concentration increases as well until one approaches serpentine which has some nutrient deficiencies. The color of the rock also changes, getting darker through this sequence, until one gets to serpentine which has a green color.

Chris Firestone noted that for the botanist seeking to use these ideas, the DCNR does have a Bureau of Topography and Geology, and one can look them up on the web for information.

In further discussion, it was noted that areas that were glaciated can have great consistency because of the spread of till. Barry Poglein noted that there was a book put out at Bar Harbor on what plants grow at what pH.

The meeting adjourned at approximately 3 PM.