

**NEFSWG Upland Groundcover Restoration Workshop - minutes**  
**Lyonia Environmental Center, Deltona**  
**0900-1500 Monday, April 12, 2010**

We thought this link to a new Ground Cover Restoration Manual would be of interest:  
<http://sfrc.ufl.edu/CFEOR/docs/Groundcover%20booklet%20rev3.pdf>

*0830-0900 Registration*

*0900-0920 Introduction – Craig Faulhaber/Ron Concoby*

*0920-0945 Speaker – Nancy Bissett (The Natives, Inc.)*

- Reedy Creek Mitigation Bank: started with Bahia pasture.
- First, critical step is to kill all the exotic grasses.
- Site herbicided, then disked and rolled to chop rhizomes and achieve flat seed-bed-ready surface. Then herbicided again.
- Need to make sure you get good seed-soil contact.
- Used big green silage cutter to harvest seed. The cutter collects a lot of stems as well as the seeds, which creates “mulch” to help prevent seeds from washing away in wind and rain.
- Also did hand collecting for species that mature earlier in the year, pioneer species, and species that aren’t collected in general harvest, especially in drier or wetter parts of site.
- To spread seed, used modified sod spreader that essentially dumps seed on ground. Important part is to make rough surface that puts the seed on the top ½ to 1 inch of the soil.
- Hard to economically irrigate large areas, but not necessary with good rainfall.
- Lopsided Indian grass came up 1 year later.
- First year had a lot of dog fennel that was controlled with wicking system that left desirable vegetation under it intact. Only necessary to control dog fennel with thick fennel; otherwise, it will disappear on its own over time.
- Used Plateau to control Bahia grass that came back, and natives occupied the new open areas through reseeding.
- Many seeds hand-added to mix.
- For hog damage, re-vegetated with blue maidencane but also *Coreopsis leavenworthii*.
- *Hartwrightia floridana* is one of 12 rare species that were hand reseeded. Also hooded pitcher plant (*Sarracenia minor*) and fallflowering Ixia (*Nemastylis floridana*, a.k.a. celestial lily) were reseeded.
- Didn’t burn site until 5 years after but could have burned it 2 years later. Knocked back shrubs such as wax myrtle.
- Redtop panicums (*Panicum longifolium* and *P. rigidulum*) were hand-seeded back in site. These can be useful on wetter sites.
- Wildflowers on seepage slope were reseeded.

- Wiregrass produced a lot of seed after burn.
- Driers spots filled in with lovegrass and some other grasses.
- See graph from Nancy's [presentation](#) posted on the Scrub-jay SharePoint site for more info. Note % covers of indigenous species after 5 years.
- % cover of wiregrass. Few visible at first, but fill in.
- Shrubs planted summer after seeding. But there is wisdom in waiting a few years until all of your exotics are controlled if possible.
- 277 species on restoration part of site.
- Persistent Exotics: top 5: Bahia Grass (*Paspalum notatum*), Cogon Grass (*Imperata cylindrica*), Natal Grass (*Rhynchelytrum repens*), Torpedo Grass (*Panicum repens*), Bermuda Grass (*Cynodon dactylon*). 4 of the 5 are rhizomatous and spread quickly.
- Bahia Grass: one tiny spot missed during spraying can turn into 4' spot in a year. Need to do follow-up. Sprayed with Plateau in May or early June, and this killed Bahia but not natives.
- Natal Grass: not rhizomatous, but matures produces seed quickly – seedbank life is probably short, so if you can get control if you get rid of the seedbank. Have applied pre-emergent herbicide during site prep and had frequent follow-up. Do precise application with backpack sprayer so the natives don't get killed.
- Cogon Grass: often pops up 3-4 years later.. Used Imazopir (Arsenal) with careful application so natives can be preserved while knocking back cogon.
- Torpedo Grass: Sod removal doesn't remove rhizomes of this grass. As you get into higher elevations, the deeper the rhizomes go and harder to control. May be as deep as 10". Herbicided twice in first year and killed 2/3 rhizomes by the following May. Then used chisel plow and field cultivator and raked to break up rhizomes in May. Then herbicided and chisel plowed again.
- Bermuda Grass: same problems as Torpedo grass.
- Need even site preparation to maximize germination of native seeds.
- Leave natural areas, but be careful for invasives under natives.
- Wet prairie edge often ignored for seeding but can add lots of species diversity.
- Lake Nona: they were in hurry to prepare site, so stripped 6-8" of soil on 44 acres, then burned nearby area and put its topsoil on the site. 11 months, 1.5 year in next photo. Vegetation was mowed and hayed before herbiciding to ensure even coverage of herbicide. Wet sites may be too wet to work in summer. Wind erosion can be problem; using silage cutter helps. Lovegrasses good alternative for road edges. Acorns and others hand planted.
- Green Swamp: Hydro-axed and burned to produce seed for harvest. Bahia seed germinated, but they herbicided, then followed up with Plateau.
- Other seed harvesting methods: Flail-Vac when timing is issue. Can change gear arrangement to get more seed. Made some changes to keep seed from getting blown by wind.
- Hand collected scrub species did better than wiregrass in scrubby area.
- Timing of seeding events – see graph from presentation on slide 44. Best to seed in fall, when cold fronts are dropping rain. Helps some asters germinate, but

some grasses germinate well in spring, though it is a low rainfall and high evaporation period so more difficult. Top surface of soil dries out quickly between rains in Summer.

- Urban project in Orlando at Old Naval Air station. Lots of problems in urban areas with timing, etc. Tried hydro-seeding along edges but didn't work well. Needs more study. Site was being mowed but city of Orlando has been burning small patches.

Questions:

- Q: What % of 277 species came back from seed versus naturally recruited? Hard to tell.
- Q: Used Imazapic (a.k.a. Plateau or Cadre) and Imazapyr (a.k.a. Arsenal, Assault, or Chopper) as pre-emergent herbicide on Natal grass. Natal grass likes to germinate in early summer. Can be eliminated from some sites but need follow-up.
- Q: Dog fennel wicking: carpet fabric over tube that emits Glyphosate that is brushed over the dog fennel but not lower plants.
- Q: how do you work around native vegetation such as shrubs? A: Herbicide as close to them as possible. Need follow up. Palmetto and pawpaw can take multiple herbiciding so can spray right on them.

0945-1010 Speaker – Jim Kelly (Eco-Logic Restoration Services, LLC.)

- Collection site in Ocala National Forest (ONF).
- Will focus on logistical considerations and look at what happens on ground.
- What habitats are suitable for restoring?
- Old citrus site in Ferndale Preserve. Lots of Natal grass and dog fennel. Many people say stay within 50-75 miles for donor site. Also important to match topography and soil types. Try to get as many different seeds as possible. Went to 6 different areas in ONF to get different seeds.
- Recipient site: FCL-LMR, Fort Lonesome. Had many sand tailings high in phosphorus. Mesic prairie and wet prairie areas. Areas disked. Went to Ona, FL for seed since it mimicked recipient site ecologically. Within 50 miles of donor site. Had just been burned the year before. Area leased from a rancher. You have to be sure collection site has been recently burned and is well maintained. Wire grass germination increases with burning.
- Recipient site Prep: Ferndale: many unwanted trees and shrubs: laurel oaks, banana plants. Use big mulcher. Had lots of woody debris on ground after mulching. Used 60' boom sprayer to herbicide to spray Glyphosate and Garlon and killed everything including Bahia grass and Cesar Weed. After herbicide, burned well to reduce thatch. Then disked. May have to disc 2-3 times. Did site 2x with heavy disc, then again with lighter disc. Herbicided in between disking. Did 8-10" deep discs. Site prep is critical. Needs to be level, but need about 1" deep furrow before seeding.
- Seed collection: Need to watch seed as it comes on in fall. Usually Nov. 1 to mid-December to collect. Camped out at collection site for 6 weeks collecting seed. First hand collected seeds that came on early. *Liatris tenuifolia*, lopsided Indian

grass (*Sorghastrum secundum*), *Carphephorus corymbosus* all collected. Had to scout forest for desired species. All came in at different times. Flail vac doesn't go down low enough to get smaller seeds. Garberia (*Garberia heterophylla*) didn't come on until after wiregrass collected – collected by hand in mid-December after all wire grass collected.

- Used hand –held devices and pull behind attachment with adjustable height. Flail-Vac seed stripper – can adjust stripper while moving. Would run Flail-Vac for 20-30 min. until full, then dump seeds on tarp. Seed was pretty clean. Seed needs to be stored dry – had to be dried at nursery before getting bagged sometimes. Then need to weigh it. Try to put out 16-17 lbs./acre. 50 seeds/square foot is hard to measure. Packed seed put in cold storage unit. Seed needs to be kept separate.
- Seed installation: first time they did this on Mosaic property, used blower than rolled afterwards. Grasslander can handle bulky seeds and sticks/stems. Can put different types of seed in different bins in Grasslander. Also used antique Massey Ferguson tractor that worked well but wasn't built to take seed, so had to spread seed by hand on top of it. Afterwards drove over seed with a drag. To quantify seeds/square foot, can use ruler or put out floor mat and count seeds.

Questions:

- Q: used subcontractor for initial treatments, but did follow-ups themselves on ATVs or by hand. After project is going, may use wick or do lots of selective backpack work mostly. [TerraGator](#) should work well and can do 100+ acres/day. Sometimes first treatment of large area by helicopter.

1010-1025 Break

1025-1050 Speaker – Steve Glass (Florida Fish and Wildlife Conservation Commission (FWC), Three Lakes Wildlife Management Area)

- FWC: 1.5 million acres land. About 300,000 acres in agricultural use.
- Restoration costs \$1200-1600/acre.
- Ground Cover Restoration (GCR) team established in 2004 with 1-3 biologists from each region of state.
- In 2005 set up 40 acre plot, then in 2006 had 45 acres, then 2008 had about 70 acre site. Didn't have Bermuda, Natal or torpedo grasses. Mostly classic abandoned pasture with Bahia.
- In July used 2-3% Glyphosate with broadcast sprayer. Also used ATVs for follow-up. Need to keep herbiciding as often as needed to kill everything – no set number of times but they typically do two.
- Did second herbicide in October. Bahia doesn't die as easily under trees, even when sprayed.
- Used root rake to take out stumps since Grasslander doesn't work well with stumps and bumps. Disked 2-3 times in different directions to break up Bahia. Final stage was rolling to make flat surface and have good seed contact.
- Seed collections: Lots of native areas on 3-Lakes to collect seed so did it on site. Dates for seed collection: 1. Lopsided Indian grass: Oct. 9-19 for 5-7 days. Need

to do quickly or will miss it. 2. Wiregrass: Nov. 17-Dec. 5 but haven't tried to push it later. 3. Hand collection for other species in spring, summer and fall.

- When to harvest Indian grass? When seed falls from stem. When yellow flowers form you are a few days away. Better to err on side of collecting too early.
- Have used 6 and 12' foot model of Flail vac. 12' models often get dinged up because hard to see obstacles. Like to conduct seed collect in tandem because if one tractor goes down you won't miss out. Have had 4 tractors working together. And can get up to 500 lbs. of wiregrass in a day with 4 tractors.
- Test wiregrass to make sure seed is there – see slide.
- Sometimes after May and June burns, don't have viable seed. 3-4 days before ready to collect, look at some seeds under microscope to see if they have viable seeds. If seed is too liquid, it's not ripe. Cheese-like stage is OK to harvest, but amber colored seed is best. Best if 30-50% of seeds appear to be viable but may have to deal with less though best to have more. At Webb after a hurricane year, had 0% seed production.
- Dump seed on a trailer and sort a little there first. Need lots of space to dry for at least 3 days then fluff to make sure no moisture. Get 8-10 lbs/bag.
- Seed collection observation for lopsided Indiangrass (LIG)
  - LIG must be collected during a very short window of time. Need to watch carefully or you will miss your opportunity. For Osceola county, this window has been from October 9-19.
  - LIG is typically collected from areas that were burned 1.5-3.0 years prior; doesn't seem to matter if it was a dormant or growing season burn.
  - Depending on the quality of your site, you can expect to collect approximately 8-10 lbs per hour.
  - On average, you can expect to collect 10-12 lbs per acre on a good LIG site. This will vary depending on the LIG density, the tractor operator, and the timing of the collection.
  - In summary, on good sites it will take approximately 7-15 acres and 9-16 hours to collect 100 lbs of LIG.
- Seed collection observations for wiregrass.
  - Need to have multiple burn units to choose from with a variety of burn dates that at least include the months May thru July. June and July seem to be the best months at Three Lakes.
  - A dry Spring may have a negative effect on early seed production.
  - Need to test your seed before you start collecting.
  - On good sites, you can expect to collect approximately 13 lbs per hour and approximately 10 lbs per acre.
  - In summary, on good sites it will take approximately 7-18 acres and 6–10 man-hours to collect 100 pounds of wiregrass seed.
- 3-Lakes burns 10-15,000 acres/year. Sometimes hard to find collection times for wiregrass. May need to spread out collection times – one year August was best time. May-June burns may not produce seed because it is too dry. Pull seed from multiple burn units.

- Planting seed: with either 5 or 8' Grasslander. Don't like 5' Grasslander and it takes longer also. Target 8-10 lbs/acre wiregrass and 10-12 lbs/acre lopsided Indian grass. Haven't got 15-16 lbs/acre like Nancy B. Will need to modify Grasslander. Built custom rack to store seed. Will use Grasslander on large gear. Want to get seeds to fall as close to ground as possible so will need to modify machine for that. Use inner tubes around the tubes so the seed falls closer to the ground. Use smallest tractor possible. Usually takes 1 hr/acre to plant.
- It works: 2005 site in Oct. 2008 had very thick lopsided Indian grass.
- Some results: 67 species on restoration site compared to 81 on donor site. Exotics never eliminated – still have 10 species but in low frequency, mainly Bahia.
- Final thoughts and Observations: will need monitoring by someone who knows plants well. Must spot-treat exotics. Plateau has worked well. Will likely have some failures when attempting restoration. Third attempt got worst results, first attempt got best.

Questions:

- Q: are you monitoring quail? No, lots of monitoring on hold because of budget issues.
- Q: what do you spend/acre on places that worked? Hard to say since all is done in house, have own equipment, and herbicide is cheap.
- Ron C: 6' Flail-Vac attachment costs about \$10K, best on 75 HP tractor. Grasslander about \$10K or more for a new one. Hard to get used ones.

1050-1110 Speaker – Chris Matson (TNC – Disney Wilderness Preserve)

- Restoration from Bahia grass to Pine Flatwoods Groundcover.
- TNC started at Disney Wilderness Preserve (DWP) with wetland restoration but then moved into upland restoration. Chris has experience with prairie restoration out in the Midwest.
- “Ecological restoration is a process of problem solving and every single restoration is its own problem” Nancy Bissett. That is very true at the individual project level, but there is a pattern that happens over time with all of these groundcover restorations. We are seeing that with these presentations today.
- First question you will want to ask is, “What are you trying to achieve?”
- Think of this as, ‘What is this going to be like in 100 years?’ The presence of trees can become an obstacle to other restoration actions such as herbicide. Want to have clean slate at beginning unless you already have some nice old trees.
- Did a pilot study at Disney Wilderness Preserve (DWP) to determine what methods of Bahia grass removal were crucial, functional and economical. Result: need to spray a lot. If you do herbicide work well, you can establish groundcover if you use a Grasslander. If you're using some other method such as a hayblower (only costs a few 100\$ to rent or not much to own your own - you can tow one behind), but that increases your labor costs over what a Grasslander does because you need a driver, someone blowing the seed, someone mixing the

seed, and someone throwing the seeding onto the blower. So you have 4 people doing the job of what a Grasslander does with 1 or 2 people.

- Before spraying a lot, first need considerations of what you're trying to do. If you're doing a full restoration and you have the flexibility with your timelines, you should always try to do your hydrology work concurrently or just before you get your seeding done to reduce the chance of having some sort of a water interaction. For example: Chris restored the hydrology on a site after restoration (seed planting) then all the species changed because the site became more wet. Luckily there were some wetlands species in the mix, so those did well.
- Need to foresee possible dry and wet conditions that could happen at site – it could make the difference in what species establish. A dry or wet spring could make the difference in whether you have early established species on the dry or wet side.
- Wait until last possible few weeks to pull cows off because they keep Bahia seed count very low. The most recent seed is most viable and cows keep that low. Cattle also keep weed growth down. If you can't do restoration quickly after cows are off you may get a wax myrtle woodland that's a lot more expensive to control than just plain Bahia since there's the extra element of woody growth.
- Site prep: Wait until last minute to remove fences that can keep out ATVs and at least help minimize hog intrusion.
- Everyone around state with large tracts of land has hog issues and it's a big deal to find out what to do with the hogs to try to keep them out.
- Debate over what's better: electric or hog wire fences. Chris did the numbers and found the cost to run hog wire fence around a 400 acre area to supplement existing fence was reasonable.
- Maintenance of electric fence is expensive so don't use electric fence unless you are in an area where fence repair is fast, easy and hog population is low since they often damage electric fences.
- Site prep: Herbicide is the most economical way to get rid of Bahia grass apart from sodding then doing herbicide.
- You have to burn it off in order to get really good contact of herbicide with that Bahia grass. The heavy litter can sometimes block a large percentage of the ground cover.
- Only use disking in a situation where it serves a purpose. Other people disk to grind up the Bahia grass rhizomes. Once it's dead it's an organic soil component.
- Started disking early during rudimentary herbicide application but since it was an incomplete herbicide application it was a problem. If you do disk, you must have a complete herbicide application or you will increase your invasives and your sodgrasses: Bermuda grass, cogon grass, torpedo grass, Bahia grass, Limbo grass. We would use disking in situations where we need to cut torpedo or cogon grass in small amounts.
- Root rake is preferred tool to do restoration work quickly but there are many other options available for sensitive sites.
- Liked Steve Glass's idea of looking at every machine you buy and possibly modifying it. It was a great idea to put inner tubes at the bottom of the chutes. At

DWP, installed mud flaps on the sides of their first Grasslander to keep the wind from blowing through and to keep seeds from blowing around so much and installed big pieces of plywood on the back to stand on.

- Slide.11: Sod grass removal review slide reviews above points.
- Slide.13: Results of individual restorations at DWP. Non-native cover threshold was 20% but could have been set at 10%.
- Slide 14: Site 1: Downside of single herbicide with multiple disking: requires lots of follow up spot treatments if you don't do the herbicide right. Followed up with a broadcast treatment of Plateau that cost about 35\$/acre just for the chemicals.
- Slides 15-22 show restoration progress at Candler I West B.
- Slide 23: Site 2: multiple herbicide, no disk.
- Slides 24-30 show Graves VI slides. Foreground burned in 2008 slide. Have less wiregrass than other sites. Tend to rely more on bluestem and lopsided Indian grasses. Steve Glass had more wiregrass collected per site or day – would expect less than half at DWP.
- Slide 32: about 3 years after seeding event. Baby goldenrods, elephant foot coming up also.

Questions:

- Q: how long did Plateau (Imazapic) stay in soil? A: This is a very persistent chemical and there are strict rates for application. Can only put 12 oz per acre per year in soil. Sprayed Plateau 1.5 years before planting. Aerially applied Plateau to another site to reduce Bahia grass. Plateau will kill pines and seedlings of many groundcover plants if they're active. Will sit in soil until level of moisture allow it to start to be taken up into plants. If you have a drought year it can sit in soil for a long time and affect your seeding. Nancy B: applied Plateau early in summer so it's active when Natal grass is germinating then seeding was OK by Nov. or Dec. (in well-drained sandy soils and typical summer rain). Chris: tried to kill sod using Plateau but it wasn't effective because it couldn't kill enough Bahia grass and it made it harder to seed things in. Gave up on using Plateau as an initial treatment. Nancy: Imazapic not as good as Imazapyr to control most species. Chris: using Imazapyr alone right now.
- Q; what bluestem are you trying to encourage? *Andropogon ternarius* on drier sites and *A. brachystachyus* on wetter sites. Others are harder to find or less common.

Ron: restoration costs:

- Burning: good resource is look at old bids send out to counties: can look at Orange Co, FWC, etc. Lots of range with prices, and prices have come down in past years due to competition for contract seeding. Highest prices 2-10 years ago were 2-3,000\$/acre but recently down to 800\$/acre including prepping, disking, herbiciding, seeding and quarterly reapplying.
- Important to evaluate restoration sites of companies to make sure they're successful.



- Contract burning may cost 25-100\$/acre. Cheaper in north FL - often around 25\$/acre. Lots of variation depending on site size. Smaller sites less than 50 acres usually 3500\$/day to burn.
- Aerial application of herbicide: 25-75\$ acre
- Chemical costs: 25-180\$/acre for chemicals depending on amounts and not counting labor. Garlon is 100\$/gallon.
- There are grants for different applications. Sometime grant applications are only a couple of pages. With grants, have to track use, but not difficult.
- Broadcast spraying: about 85\$/acre. If you catch a farmer with equipment at right time of year, can do it for as low as 35\$/acre. If you have to rent equipment yourself, may cost as much as 250\$/acre. Best to shop around with different contractors.
- Backpack spraying depends of how much spraying: usually about 225\$/acre but can be as high as 375\$/acre per event. Sometimes quarterly is not enough. It's always a learning experiences and every habitat is different. Go back and look at bids on county websites to see what herbicide costs area.
- Fencing for hogs: depends on time of year whether people are selling fence. May be similar cost for electric and hog fence depending on time of year. Electric fence needs to be monitored frequently, and you need to maintain bare ground around it.
- Disking: may be as low as 15\$/acre for shallow disking and 25\$/acre for heavy disking but can be 45-75\$/acres at times.
- Equipment: newer needs less maintenance but old equipment may be expensive to maintain. Needs to be taken care of well so they don't burn up because of oil underneath or not kept clean. So important to keep things very clean.
- Seed collection: very variable. For collection and putting it on ground: 400-1800\$/acres but may be cheaper for agencies. Depends on travel and time. Has even been as high as 3000\$/acres in past.
- Follow-up: backpacking. Needs to be very meticulous and to have a good botanist. 225-450\$/acre. Nuisance exotic control on bids varies – can be as low as 0% (which seems too low). 5% seems to be the norm, but 10% is reasonable.

#### *1110-1120 Break*

#### *1120-1200 Panel Discussion (Nancy B., Jim K., Ron C., Steve G., Chris M.)*

- Contract language important to get contractors experienced in ecological restoration and not have to go to lowest bidder who may not have experience. Bids that are too low may make it impossible to accomplish goal.
- Ron: Go back and look at the bid packages. Pick and choose what you want in bid package, such as the number of times an area will be treated or distance to seed collection site.
- Nancy: "Request for proposals" have been used then were evaluated for most qualified rather than just the low bid. Ask for qualifications. Would want to be able to go look at previous sites.

- Ron: if you want someone who has experience, ask to see project that have been done in the last year, one in the last 3 years, and one in past 5 years or longer to eliminate people who are not experienced.
- Nancy: you want to be able to see site and have mechanism to disqualify people who did sites you don't like.
- Ron: go to MyFlorida.com to see old bids – it's all public record. You can get all info for 5\$ on a CD from most counties. Go to county websites to see the vendors and the numbers.
- Randy Sleister: can do professional services contracts. Can pre-select consultants rather than going out for bids.
- Carrie S: Federal government can also make short list of qualified vendors to work off of.

#### Questions:

- Q: Three factors: Technical evaluation, past performance and cost all evaluated. Need to say up front that cost is not top factor and give them a list factors you will evaluate against.
- Jim K: don't put too much in contract and cast too wide a net because will limit options.
- Q: what about areas overtaken by oaks but not exotics (i.e., it's just fire-suppressed with understory taken over by oaks). How do you do seed restoration in this case? Nancy: it's possible to do row seeding between stumps after site has been logged. Most important thing is good seed-soil contact. Chris M: there's also complexity of duff buildup; you have to consider the value of pines other than for seedling production. Restoration may kill trees depending on conditions. Often have small pockets of native vegetation you want to encourage. It's a matter of considering trade-offs. Jim K: it depends on your site. Went into a site with 15' tall gallberries, 30-40' rough. Did catastrophic fire then logged site and continued with fire regime. To his surprise, there was a great seed bank there. Try fire and see what comes back. Ron C: winter burns can also work when you have that much fuel. CRP programs in GA require farmers to follow up with wire grass seeding after herbicide.
- Carrie S: have 100s of teenage scouts raking duff around trees making "donut holes" to not kill trees. Then need to leave time for feeder roots of the pines to re-establish. Feeder roots establish in March-April.
- Ron: you'll be surprised at the seed that's in the ground.
- Q: what about seed viability of invasives? What are some herbicides that work best? Nancy: Imazapic and Imazapyr are active when seed starts to germinate. The main thing is you need to herbicide before seeds are mature. E.g., hairy indigo often comes up massively, but it's an annual. If you can get site mowed before plants mature you'll have less to control. Jim: you have to choose your battles with herbicide. Can mow annuals to keep them from going to seed and focus on perennial grasses.
- Q: what about dog fennel going away – how does that work? Chris: longer lived lower growing perennial species out compete dogfennel (*Eupatorium capillifolium*) and hairy partridge peas (*Chamaecrista fasciculata*)[is this correct?]

and hairy indigo (*Indigofera hirsute*) over time. But sometimes these can get dense. Sometimes you can't mow because you have native perennials you wish to protect from mowing. In this situation, you can use Diquat Dibromide spot treatments on hairy indigo worked well at killing it but didn't kill perennials.

Nancy: dog fennel is not an annual, it will be out competed by native perennials eventually. Jim: annuals can be your friends in many cases. Annuals come in until perennials take over. It may look weedy, but that's not necessarily a problem. Chris: If these weedy species persist, you may need to identify the cause; instead of focusing on treating the plant, you may need to focus on the cause of its persistence. Hog damage or something else may cause perennials to not establish and may encourage dog fennel and sesbania to reestablish.

- Q: What about Mexican tea (*Chenopodium ambrosioides*) as a problem? A. Jim: not so bad if there's just a little of it, but can shade out many other plants if it gets tall. Has had good luck when it's young (6-8" tall) can kill it with 1.5-2% Glyphosate. Chris: some native may not establish well in areas with abundance of organic matter from tree shredding, mulching, etc.. Given enough sunlight, this organic material oxidizes and may go away over time. This can help before you proceed.
- Q: is there a cover plant to use to shade out invasives? Nancy: dogfennel (*Eupatorium capillifolium*) has long seed bank life. Like areas between wet and dry.

#### 1200-1300 Lunch

#### 1300-1340 Panel Discussion (continued)

- Q: do you have recommendations for burning herbaceous cypress domes w/ 20 years of *Lyonia* growth? Nancy B: cypress domes are best burned in dry season. Q: How to get fire through after ground cover lost? Jim K: mulched titi (*Cyrilla racemiflora*) bogs in Panhandle in dry season then burned. Encouraged all to become members of Society for Ecological Restoration. Ron C: depends on size of site. May use chainsaw crew to lay down *Lyonia*. Get it on the ground before you get fire through there.
- Q: what about restoring true scrub, not scrubby flatwoods? Some sites were pastures, all were once scrub. How to get something to live there once you herbicide since it's so hot? Have planted one site twice and nothing grew. Nancy: have done several scrub sites and is working on 5-6 now, some former citrus groves. Planting all the shrubs is cost prohibitive. Her approach: seeding a mixed groundcover that's high in handpicked species that will reseed such as some buckwheats and corkscrew threawn to give site some cover. Then do some planting of shrubs (5-600/acre) and watering. Best to plant in late July or August since that's when rains are most consistent. Follow up with monitoring, and water when plants are in stress. Also collect acorns as they mature and spread throughout site. Dribbling acorns is easier and less expensive than planting shrubs. Maria Z: want to maintain open patches for Florida scrub-jays – what about large containerize plants? Nancy: usually gallon size is easier to get

established but bigger ones (size??) don't often do well. CS: lots of folks say cut off top and just plant the root ball when using containerized plants. Ron: there are also studies that show that seedlings do better than plantings. CS: what about adding coarse woody debris to add moisture to site? Or do you just start with white sand? Ron: Nancy used silage cutter that leaves some material on site to hold seeds in place. *Palafoxia* and threeawn (*Aristida* sp.) respond well. In Ocala, *Garberia* came into areas that had been logged. Nancy: *Garberia* matures quickly.

- Peter M: put in 10,000 containerized oak trees at PEAR park in 50 acres. Found containerized plants need to be watered first year and spring of second year. Used gallon jugs to water plants. Chris: contact Eric Menges and Stacy Smith who have worked at Archbold Biological Station with scrub restoration.
- Q: Is anyone using Terrasorb? Nancy: did not find it to be particularly effective.
- Q: we have more volunteer time than money and a lot of areas with nothing growing. With that in mind, how likely is it that we can have volunteer crews hand collect. What will make that successful to do it by hand? Nancy: it's very doable that way. For small areas, you can scatter seeds from an ATV then roll it as long as you pay attention to time of year. Ron: Tricia at Lake County Water Authority is doing some small scale projects – can expand then. Jim K: Placement is also critical – restoration should be near a source site. Nancy: Acorn dibbling is a good volunteer project. Chris M: has lots of experience with volunteers.
- Q: has a sandpine plantation (for 20 years) that was citrus since 50s but was historically sandhill. Thinks native seedbank is gone. What would you suggest? Jim K: how do you know there's no seed bank? JM: don't know for sure but will be doing seedbank study soon by clearing area and seeing what comes back. Alice Baird: Lake Louisa SP had big areas in similar condition. Grad student did study on seed bank and found no notable natives and also found that pH was 7 instead of 5 because lime was added. Used 61-63 species of sandhill seeds using a blower and had decent success. Wiregrass, lop-sided Indian grass, corkscrew threeawn and dahlia came in well but many other species didn't. Nancy: the wetter the site, the more likely to have a native seed bank; the less disturbance also. Most plants in seed bank are likely pioneering, weedy species, not wiregrass or similar species. Amy Jenkins did Masters on seed bank at Disney Wilderness Preserve in pastures and restored areas.
- Q: What about oak seedlings planted in Bahia pasture – can this restoration be saved? Craig: there are several sites around FL with similar situation. Chris M: since oaks are small, herbicide would affect their foliage, so may want to wait until oaks are taller. Then herbicide under them. If there is lots of organic bahia thatch in the sand, you may be able to spray between oaks rather than over them. Could put plastic bags over oaks or other plants you want to keep and spray the whole area. Q: Could wicking be applied at ground level? Nancy: why not? Ron: a lot of this is being creative -- used Coke bottles on spray wands to focus application on specific plants and avoid others.
- Q: how do you restore a hammock that's overrun with Brazilian pepper and bad grasses? Nancy: hammock easy because you don't have to worry about

groundcover restoration. Jim K: you could use mulching equipment to get everything low, then herbicide it all when they start to resprout. Might need multiple treatments. With torpedo and Cogon grass, have better luck with 1.5% solution of Glyphosate than with strong mixes. Apply in Oct. and Nov. before first frost while it's still actively growing. Chris: biggest enemy in hammock restoration will be fire that will kill some restored plants so need to keep fire out. Q: can you transplant trees? Ron: can plant small trees. Chris: it's often very expensive. Can use hacked back old oak root ball and it may work. Nancy: it may be easier to plant 1-3 gallon containers. Ron: Brazilian pepper loves fire, put tarps down underneath them to catch the seed when you cut them down. Nancy: after chopping in May, sprayed cut stumps and had very little resprouting.

- Q: what about disking in true scrub? Or can you just do lots of herbicide instead? Nancy: it depends on site, and don't want to chop up sand skinks.
- Q: what about some methods to get overstory established? Nancy: best to get groundcover well established first because you can overspray with some herbicides if you haven't established overstory yet. Ron: you'll want to be comfortable with level of nuisance species – if you think it won't change much in a year, you may be ready to start next phase. Chris: depends on what you're planning on doing with fire – want to put plants in soon after a fire (days or weeks). Ron: especially with longleaf pines, you can burn a year after you put them in if you don't have heavy fuels.
- Wrap up Ron: happy to look at a site for free and give opinion on what to do. Jim: there's little money available to do follow up monitoring but it's very important. Usually only mitigation banks that require monitoring but it's also important to do in smaller projects.

#### *1340-1405 Break*

1405-1420 Committee Reports: committees meet when there's a problem that needs to be solved. (*Education, Monitoring, Land Mgt, Private Lands*)

Education: Katrina Locke: held fire annual FSJ festival on Feb. 20 at Lyonia Environmental Center. Next year will be at Merritt Island NWR on Sat. Feb. 19<sup>th</sup>, 2011. Had speakers in classrooms, had displays in auditorium, had guided walks, had music. All people donated time and festival was done on low budget. Many different people involved from Volusia County to FSJ Trail, ABS, FWC, TNC, and others. Estimated more than 1,000 people came to festival. All free advertising at festival. FSJ Festival Scrub-Jay T-shirts on sale for 7\$ including tax. If you have any ideas for FSJ Ed. Committee activities, please let Katrina know.

- Bruce and Cathy Brown: 12\$/FSJ front license plate.

Monitoring: Jason DePue: meet one year ago to discuss monitoring needs. Number one need was standardizing banding schemes and deciding which parks would have unique marking schemes to prevent overlap. Standardized as much as possible and send out banding scheme to all FSJ banders in region. Lake and Volusia Co had similar colors used, so did other counties. Some sites had changed site markers so organized all this info. Group also discussed when to band and when not to band. Annual surveys often

require only limited banding (just enough to help tell groups apart). Areas with intensive monitoring and research need all birds banded. Also looked at banding supplies and put suppliers on list and discussed who can band at different sites to see who can help whom. If you have banding needs, contact Craig. Also discussed band colors and Darvick vs. celluloid band colors and standardized names for different colors to eliminate that confusion. Discussed permits and how to get them depending on if you were a private or state agency, etc. also contact Craig about this. Still need to get banding matrix out to new committee members. Are contacting FWC about permitting and interagency cooperation. Looked at other ways of attaching bands.

Land Management: Beth Jackson: Land mgmt field on May 6, 2009. First site was Henson Property (272 acres): has no groundcover and not sure why. Was cleared in 1930s for ag purposes but never planted. Disturbed hydrology because of lowering of lakes. Also visited Isle of Pine Preserve (formally Hampton Bay) (464 acres): hadn't been managed in a long time so very overgrown. Will timber out some pines. Also needed some invasive control in wetlands – downy rose myrtle (*Rhodomyrtus tomentosa*). Hired Ron to do mechanical treatment – mulched using sloppy chop. Burned site in March. It was a very valuable experience to have a group come out and give input. Would encourage anyone with land management questions to ask group to visit their site.

- Craig: What time of year is best for field trips? November – but collecting seed then? May? We'd like to also see sites that have had challenges that have been met.

Private Lands: Mark Asleson was going to report on this but couldn't make it. Most important thing to come out of the meeting was letting counties know about private lands initiatives both in FWC and FWS. Mark will follow up with this.

#### *1420-1440 News and Innovations*

1420-1430 Scrub-jay translocation - Kimberly Tillman (SJFWMD): Dec. 2009. Had 6 FSJ family (15 FSJs) translocation on Buck Lake Conservation Area. All 6 families were listed as 'taken' birds from a previous Habitat Conservation Plan. Craig Faulhaber (FWC), Mike Jennings (FWS), and Brevard Zoo all helped. St. Johns River WMD prepped site to receive jays. Dave Breininger: helped band jays. Vivian Soriero and Vince Lamb did daily and now weekly monitoring. 13 of 15 translocated FSJs are being monitored weekly. All groups are attempting to nest. Volunteers are gathering lots of data. One family moved about 1 mile N off site and are still being monitored by volunteers. 3 jays are near an EELs property that was just burned. This was 'soft release' translocation. Volunteers brought a specific diet of food to jays. Instead of feeding jays in the same place every time, volunteers fed jays where birds were.

- Craig: FWC and FWS are working on translocation guidelines. He will let group know when guidelines are out.

1430-1440 Lyonia Environmental Center – Katrina Locke (Volusia County): opened in October 2009. Site originally had library. Have a display that focuses on scrub and links everything to water. Has two classrooms that are busy to May with students then have

summer camps. FSJ Festival brought awareness of site to local people. Also have photography exhibit. Have education staff, but don't always know answers to all the questions so would like people from this group to volunteers as subject matter experts. If anyone has ideas for workshop topics or know people who do, please contact Katrina. Some ideas for topics include scrub, plants, animals, fire, etc.

1440-1450 Suggestions for Next Workshop: Presentations from this workshop and minutes will be posted on Scrub-Jay SharePoint site. Just Google 'Scrub-jay' and 'SharePoint' and site will be the first thing that comes up. Here's the link:

- <http://share2.myfwc.com/scrubjay/default.aspx>
- Ron: would like to know about grant opportunities – these are posted on SharePoint.
- Sammy: individual working groups give people a sense of what's going on in each region, but feels lost on a statewide scale. It would be great if we could have more mobility across the state. What is the statewide collective mission and statewide priorities? As much as she wants grant money, could it better be used somewhere else that makes scientific and logistical sense? Craig: Scrub symposium occurred several years back.
- Ron: people in other regions are doing interesting work also. Would you like to hear about that? Dave Gordon has 9 FSJ translocations under belt.
- Q: what about every other year or every third year do a statewide conference?

*1450-1500 Wrap up*