

13

00:02:15.780 --> 00:02:22.590

Denise Ellsworth: Great so my clock says 10 o'clock are on the hour so let's go ahead and get started welcome everyone to the be short course for Community scientists.

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00:02:23.010 --> 00:02:32.940

Denise Ellsworth: i'm Denise ellsworth with the Ohio State University department of entomology and extension so welcome if you're returning to this webinar series welcome back if you're new we're glad to have you.

15

00:02:33.420 --> 00:02:41.790

Denise Ellsworth: All of our sessions are recorded and posted we have a web page that's up on the screen there that you.osu.edu slash be course.

16

00:02:42.240 --> 00:02:47.160

Denise Ellsworth: All the recordings are on there and they're also on our YouTube channel, so you can access those recordings.

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00:02:47.520 --> 00:02:54.240

Denise Ellsworth: If you're just if you just signed up and you're just joining us there's no particular order that you need to do those sessions so feel free to just run through and.

18

00:02:55.080 --> 00:03:01.110

Denise Ellsworth: Depending on what you're interested in and access those those webinars so we just have a couple to go.

19

00:03:01.710 --> 00:03:11.280

Denise Ellsworth: Sam Droege's here with us this morning i'll introduce them in just a minute next month is going to be Dr Mary Gardner who's with the osu department of entomology talking about.

20

00:03:11.820 --> 00:03:18.750

Denise Ellsworth: The importance of Community science in the world events mythology she's got some really nice examples and links to share with us.

21

00:03:19.350 --> 00:03:23.400

Denise Ellsworth: And then, our last session, we had a change in speaker but we're still having an expert.

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00:03:23.850 --> 00:03:31.530

Denise Ellsworth: Matthew Shepard from the Searcy Society we're excited to have him director of communication and outreach for Scorsese and he's going to be talking about.

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00:03:32.400 --> 00:03:41.880

Denise Ellsworth: The way that Community Scientist add to advocacy and change on the ground for pollinators so excited to have Matthew stepping in for that last session.

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00:03:42.630 --> 00:03:53.790

Denise Ellsworth: And we are working on a Bumblebee course for next year, so if you've enjoyed this monthly series we're going to do a similar one you all find out about that as it comes together in the New Year.

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00:03:54.870 --> 00:04:02.130

Denise Ellsworth: A little bit about our program, so we are doing these monthly webinars, as I said, the recorded and posted on our YouTube channel.

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00:04:02.850 --> 00:04:10.230

Denise Ellsworth: We are cooperating with the Chadwick Arboretum, which is our arboretum here at Ohio State University on the Columbus campus.

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00:04:10.680 --> 00:04:19.230

Denise Ellsworth: and also the US National Native Bee Monitoring Network, which is a consortium of bee researchers from across North America, who are coming together to.

28

00:04:19.710 --> 00:04:26.190

Denise Ellsworth: Share resources and put the the brightest minds and be science together to to help with native be.

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00:04:26.580 --> 00:04:41.610

Denise Ellsworth: Research and so this series is really aimed at Community Scientists to help pull all of you, together, so we can build our skills and add to that that body of researchers out there,

doing important work to to save native bees.

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00:04:43.050 --> 00:04:45.480

Denise Ellsworth: We have some funders that I want to thank we.

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00:04:46.860 --> 00:05:02.640

Denise Ellsworth: We get funding from the usda and NICO grant I Integrated Pest Management grant that specifically funds, some of our outreach in pollinator health so appreciate that that funding and also the debut expert tree company that's help with this webinar series.

32

00:05:04.050 --> 00:05:14.640

Denise Ellsworth: I want to thank and welcome marcia Carson, who is a facilitator in this program helps me here with with a lot of our zoom details marcia has been here every month and lots of other.

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00:05:15.120 --> 00:05:30.330

Denise Ellsworth: webinars that we do as well Marshall Thank you so much, if if I crash, I know I have a great backup and marcia she is a volunteer pollinator specialist here in Ohio and also an advocate with or an ambassador with the searcy society so marcia thanks so much.

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00:05:32.430 --> 00:05:40.230

Denise Ellsworth: So if you've been here before you know that we use that chat box for city and state or city and country just to see where folks are coming from.

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00:05:40.560 --> 00:05:45.600

Denise Ellsworth: As I said today we're going to go ahead and keep the chat box open at at sam's request so.

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00:05:46.140 --> 00:05:52.110

Denise Ellsworth: he'd like some input and some suggestions for resources that you all would like to share so you want to find that chat box.

37

00:05:53.040 --> 00:06:01.200

Denise Ellsworth: And then we use the Q amp a box for questions we use the up vote so as you go into the chat to the sorry to the Q amp a box.

38

00:06:01.470 --> 00:06:07.890

Denise Ellsworth: If you see a question that you'd like answered be sure to up vote on that question, it will help the question rise to the top.

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00:06:08.670 --> 00:06:16.410

Denise Ellsworth: And what we'll do once I introduced Sam he'll go through his content he's going to take us on a nice tour of some of the resources there in his lab.

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00:06:16.890 --> 00:06:24.420

Denise Ellsworth: And, as he gets to about the PowerPoint will switch over to Q amp a I know that your time is important, you may have other.

41

00:06:25.140 --> 00:06:36.330

Denise Ellsworth: Meetings or obligations, this morning, and if you need to hop off just know that the Q amp a portion will be recorded and you can go back to that hopefully if the tech gods are smiling later this afternoon.

42

00:06:38.370 --> 00:06:46.050

Denise Ellsworth: So i'd like to introduce them to be who's really one of my be heroes probably lots of you are familiar with Sam and the important work he does with.

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00:06:46.860 --> 00:06:54.720

Denise Ellsworth: The usgs be inventory and monitoring lab I first met Sam in person, a few years ago, so not only is he a.

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00:06:55.020 --> 00:07:08.130

Denise Ellsworth: An amazing be researcher and resource, but he's got a really strong background in bird conservation and also phenology so we first met in Cleveland at a phenology conference we were both talking about

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00:07:08.610 --> 00:07:14.670

Denise Ellsworth: some of the phenology work that we do, but we had taken a break for the session we were out at the.

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00:07:15.600 --> 00:07:21.360

Denise Ellsworth: Cleveland botanical garden they had one ironweed

plant in front of their entrance and there was the.

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00:07:21.840 --> 00:07:31.200

Denise Ellsworth: The specialist bee right there and Sam points it out and he said, you know this bee so I always think of Sam when I see that bee. Sam's one of these.

48

00:07:31.980 --> 00:07:43.230

Denise Ellsworth: amazing people who shares so much of his of his knowledge in a lot of different ways, he has an amazing flickr page with an incredible source of.

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00:07:43.920 --> 00:07:50.010

Denise Ellsworth: The images, let me pour to this image that show some of that photography that Sam has.

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00:07:50.670 --> 00:08:00.030

Denise Ellsworth: offered those images are up there is creative Commons and so you can use them in your programs and other you know your writings and other needs not everybody shares.

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00:08:00.420 --> 00:08:09.930

Denise Ellsworth: As widely I just love that they're all licensed can you read comments um he also has a lot of manuals those be visa Maryland field guide.

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00:08:10.710 --> 00:08:20.610

Denise Ellsworth: is out there he's shared that resource with us here in Ohio and we've created a manual for Ohio and then you fall got the link to the handy bee manual.

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00:08:21.300 --> 00:08:25.830

Denise Ellsworth: And if you scroll back up our way to the top on the chat box and we'll put those links and again.

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00:08:26.160 --> 00:08:36.090

Denise Ellsworth: I have live links to all of those great resources, I also have those on our bee course web page under the resources, you can go back in and check out some of those links later.

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00:08:36.870 --> 00:08:49.710

Denise Ellsworth: So at this time i'm going to turn the program over to Sam who's going to walk us through some of the tips and tricks from his great resource have been knowledge so Sam thanks it's so nice to see you and great to have you here this morning.

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00:08:50.610 --> 00:09:10.170

Sam Droege: Thanks to Nice and I, you know, I have to throw some compliments back because you guys have really done a great job in Ohio and activating a group of people training them and developing information about the bs of Ohio and very few States haven't done it to that level and that's where.

57

00:09:11.460 --> 00:09:25.050

Sam Droege: Our needs are is, you know how can we conserve something we know nothing about so a lot of this is a getting boots on the ground and will show you today, some of our tricks that we've learned over the past 20 years now about.

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00:09:26.610 --> 00:09:47.520

Sam Droege: I guess maybe some mundane things that are useful and So yes, I asked that the chat state open because we have certain approaches that we find useful for how we run our workflow but other people have equally valid and equally interesting and maybe stuff that will want to grab.

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00:09:49.380 --> 00:10:01.830

Sam Droege: And if, once we learn about it, so please add your unlike I use this here's a picture of that here's a link to something you can get these kinds of tweezers from these places into the chat box and.

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00:10:03.540 --> 00:10:13.500

Sam Droege: Maybe Denise will compile some of that information to at the end, so another thing I just saw a flash through on the chat about our photography technique.

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00:10:15.600 --> 00:10:36.300

Sam Droege: setup so if we have time I can move the laptop here over to our incredibly complex photography studio which is basically a beer cooler so and talk about the how that's done pretty quickly, but because we have a lot going on i'm going to jump right in we're going to start with.

62

00:10:37.320 --> 00:10:47.610

Sam Droege: And also i'll need some feedback from Denise and marsha at the top of my dance, and of course boy, this is awkward and the new video land but.

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00:10:48.690 --> 00:10:59.670

Sam Droege: about the priests how i'm doing, I know, normally not a live caster of showing you things on video So do you want, maybe i'll put this a little bit higher.

64

00:11:01.140 --> 00:11:06.120

Sam Droege: You can say bring them bring that closer hold it still any of those things.

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00:11:07.350 --> 00:11:19.110

Sam Droege: I you know my notion is that maybe i'll move too fast for video feed sometimes so just give me some feedback and people in the chat box and give feedback like oh he's going too fast so we'll see.

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00:11:19.890 --> 00:11:27.510

Sam Droege: So i'm going to start first with collecting in the field with nets that's the tradition on going to show you.

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00:11:29.070 --> 00:11:32.370

Sam Droege: My favorite net here, which is the.

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00:11:33.450 --> 00:11:50.760

Sam Droege: was done by rose entomology out of business, but now run through bio quick so For those of you who don't know bio web so someone should be typing in the bio quick link in the chat box that's the main us, and I would say, Canada, probably.

69

00:11:52.050 --> 00:12:00.300

Sam Droege: supplier of animal logical equipment, a lot of what i'll talk about that's you know more, the heart real hardware would be gotten through there.

70

00:12:00.990 --> 00:12:12.120

Sam Droege: This model, I think, is out, but I really like it, because it's got two extensions there's another extension that you go out it's got a very stiff rim, so a lot of the.

71

00:12:13.140 --> 00:12:19.560

Sam Droege: type of nets that people use, which I have examples of over here are going to have flexible rooms.

72

00:12:21.090 --> 00:12:21.660

Sam Droege: and

73

00:12:25.140 --> 00:12:36.900

Sam Droege: Which which do have to this is an 18 inch on this is at the largest size really that's practical I like it, because it gives me a bigger area but it's more tiring to swing it catches more.

74

00:12:37.170 --> 00:12:47.730

Sam Droege: Wind volume, so a lot of people are using 12 or 15 inch which are sort of a standard size by acquit models, this is the bio quip.

75

00:12:49.230 --> 00:12:56.400

Sam Droege: Standard net that you would purchase it's got the red twist if I can show this right.

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00:12:56.970 --> 00:13:06.180

Sam Droege: With my finger there risk twist top and there's a strap that goes around you can take this apart and put it in your luggage, to some extent and it's a very flexible rim.

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00:13:06.690 --> 00:13:16.530

Sam Droege: that's pretty good for lots of circumstances it's great for slapping on the ground, because it does some conforming to irregularities, but I actually prefer.

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00:13:17.370 --> 00:13:33.450

Sam Droege: This is, I think, aircraft aluminum rim so sounds expensive and it's more expensive, but because it's absolutely stiff and i've net well I have broken the tips off right so right here is where it goes into the joint.

79

00:13:34.170 --> 00:13:45.990

Sam Droege: I did break eventually and i'm using this constantly at some point, but it will crash through vegetation so even relatively stiff.

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00:13:47.610 --> 00:13:54.210

Sam Droege: woody plants, you can plow through and we won't go into a lot of detail here there's videos that we have.

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00:13:54.660 --> 00:14:05.580

Sam Droege: about doing that, but you use the Center the be on the middle of the net and you plow through the vegetation to pick it out unless it's got stickers are.

82

00:14:06.060 --> 00:14:12.120

Sam Droege: thorns on it and then there's different approaches which i'm going to skip over for now we can return to that.

83

00:14:12.420 --> 00:14:25.350

Sam Droege: But this differ from is really useful the extra extension sometimes is very useful on bees that are always just a little out of reach in a couple different ways it's a little heavier.

84

00:14:25.830 --> 00:14:35.880

Sam Droege: Bear is not this exact model, but there is a similar one with an extension on this that has the stiff rim, that would be I believe still listed as rose entomology.

85

00:14:37.290 --> 00:14:37.860

Sam Droege: Another.

86

00:14:39.120 --> 00:14:50.520

Sam Droege: type of net that's useful and use a lot is this one, which are long term volunteer Jane whitaker just donated to the lab because she's no longer in the field.

87

00:14:50.910 --> 00:15:01.710

Sam Droege: And the, this is a collapsible neck so i'm going to collapse it in a second, but you can see it actually comes, this is also available on via.

88

00:15:02.940 --> 00:15:11.730

Sam Droege: And you can see that this can go right into a backpack and you have a variety of different kinds of extensions so.

89

00:15:12.210 --> 00:15:31.350

Sam Droege: If you are working trees, or something very tall usually the cheapest and easiest way is to have this kind of net set up with extensions to whatever level, you need at some point, it becomes very wobbly but you know your options are limited, if you want to reach high.

90

00:15:32.400 --> 00:15:32.700

Sam Droege: Please.

91

00:15:34.320 --> 00:15:45.660

Sam Droege: Even sometimes if you have a little data packet actually you can fit in there too it's very handy so this just folds up and flips back out.

92

00:15:46.740 --> 00:16:09.120

Sam Droege: This is a good example of a net net Jane particular like Jane particularly likes, because it can handle foreigners a little bit better, so what you have is a canvas upper part and the lower part is the traditional aerial net, so this doesn't snag as much nor terror as much as.

93

00:16:10.500 --> 00:16:12.120

Sam Droege: The traditional net day.

94

00:16:13.980 --> 00:16:17.130

Sam Droege: Such as a lot of our nets are filthy from us, but.

95

00:16:18.300 --> 00:16:39.870

Sam Droege: such as these, these are really prone to getting snagged and after a while you get good at both spotting the snags and backing out of them, but still, particularly when you're beginning this combo bag of canvas or cloth or thick cloth at the top and a net bag at the bottom useful.

96

00:16:41.190 --> 00:16:41.640

Sam Droege: So.

97

00:16:43.080 --> 00:16:55.020

Sam Droege: let's stop on the Net front, we can return if time and interest to talk about approaches to catching bees, we have some of that on video already so once you're in the field, what.

98

00:16:55.590 --> 00:17:09.540

Sam Droege: People do is tradition would be you have a kill jar is charged with cyanide it's charged with Ethyl acetate for a couple other kinds of combinations of things we started out that way too, but now we actually.

99

00:17:10.380 --> 00:17:20.700

Sam Droege: I haven't used kill jars in quite a number of years and we find that putting everything into liquid so soapy water essentially is the way to go.

100

00:17:21.750 --> 00:17:30.270

Sam Droege: Our favorite for a couple reasons, so our favorite container is a simple centrifuge 200 millimeter I think that are hundred milliliter.

101

00:17:30.900 --> 00:17:41.160

Sam Droege: Are 50 is what that one is, you can see, by the size of my hand, these are super common I would suggest going online and looking for used ones.

102

00:17:41.850 --> 00:17:44.490

Sam Droege: This might be a good group purchase.

103

00:17:45.450 --> 00:17:54.930

Sam Droege: Through denise's group or someone someone should do group purchases and then you can divide these up because they're cheap when you find them and gross and they're often in surplus.

104

00:17:55.200 --> 00:18:05.580

Sam Droege: And if you're associated with any kind of lab these things like we have almost an infinite number of them actually i'm not giving them away so I don't have an infinite number, but they.

105

00:18:06.210 --> 00:18:16.020

Sam Droege: show up in terms of lab surplus all the time, because people buy them by the gross and then end up not Center for emerging as much as they thought so you feel that way.

106

00:18:16.350 --> 00:18:17.550

Denise Ellsworth: To you should be using.

107

00:18:21.750 --> 00:18:22.140

Sam Droege: Are we good.

108

00:18:22.530 --> 00:18:27.300

Denise Ellsworth: Okay we're good yeah I was going to do YouTube channel commercial is trying to get your link sorry about that.

109

00:18:27.540 --> 00:18:39.390

Sam Droege: Okay, no problem um so anyway it's just I fill it up about that much with water, this is really it's there's so many different ways to run this and then I add some kind of soap so.

110

00:18:39.690 --> 00:18:52.080

Sam Droege: soap in this circumstance doesn't matter you're just getting rid of the surface tension, if you don't have soap in it your bees don't expire that's my phone just ignore that don't expire.

111

00:18:53.160 --> 00:19:03.780

Sam Droege: right away the soap is actually a killing agent, and they don't go into the water very well and sink and allow you more room for collecting because the.

112

00:19:04.980 --> 00:19:10.740

Sam Droege: surface tension is there, so the procedure in general, would be i've got a net.

113

00:19:11.820 --> 00:19:13.200

Sam Droege: I am going to.

114

00:19:14.610 --> 00:19:24.450

Sam Droege: have this net and i'm going to keep collecting so normally you would catch a be taken be out if you have a killing jar it expires, then you can do another one.

115

00:19:24.780 --> 00:19:31.890

Sam Droege: But in this circumstance i'm going to continuously be catching these i'm going to snatch them down to the bottom grab that net.

116

00:19:32.430 --> 00:19:41.190

Sam Droege: All the while looking for more bees, I thought I said I wasn't going to talk about this and then i'm going to catch more and i'll have a net full of bs.

117

00:19:41.460 --> 00:19:48.600

Sam Droege: And sometimes other insects down at the bottom, I can snap that down like that to keep the stinging things down there.

118

00:19:49.170 --> 00:19:58.260

Sam Droege: You can wear a glove if you're nervous about that then i'm going to hold it against my chest i'm going to take the vial which, because of that tip.

119

00:19:58.740 --> 00:20:05.160

Sam Droege: slips right into my pocket super easily I take it out, I unscrew it I hold the CAP.

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00:20:05.580 --> 00:20:16.110

Sam Droege: Next to my fingers I bring it into the Net and then I let the bees wander out a little at a time, I make my selection for what I want I tap it in.

121

00:20:16.500 --> 00:20:33.600

Sam Droege: And I rub it against the top to pull them off because they you know they'll take their mandibles and grab on to them, and I can clean, the net out in one run, so I don't have to be putting that down picking it up taking my killing jar out putting it down.

122

00:20:34.980 --> 00:20:42.720

Sam Droege: Because I can pull as many bees, as they want into this jar so they might try to climb out a little bit, but the simple tap puts them back.

123

00:20:43.050 --> 00:20:51.390

Sam Droege: But in a killing jar what happens is you get a chance to take one be in and then, when you try and get the second be the first be leaves.

124

00:20:51.720 --> 00:21:03.000

Sam Droege: So this is the way to go, but it's going to require as

we'll talk about dealing with wet fees in general, always process your bs as quickly as possible, if you want the best work.

125

00:21:04.080 --> 00:21:04.620

Sam Droege: So.

126

00:21:05.010 --> 00:21:14.400

Denise Ellsworth: There was a question already about why would a citizen scientist or Community scientists kill bees and I know you're going to talk about that I don't know if you want to address it now or a little bit later.

127

00:21:14.490 --> 00:21:27.540

Sam Droege: It wasn't going yeah there's so many things to talk about the best thing is maybe I don't know if you have a email list I can send a whole long list of discussions of lethal versus non lethal and why.

128

00:21:28.410 --> 00:21:34.890

Sam Droege: You would do that, so the back to parse it down to bare bones so.

129

00:21:35.550 --> 00:21:44.400

Sam Droege: it's an individual decision, and there are some things that can be done, that are non lethal mostly with things like bumblebees and photography but.

130

00:21:44.850 --> 00:21:59.220

Sam Droege: In terms of the what I would call the higher value things we have to look at them under the microscope just tell what they are like I can't even I can't even if i've caught them in a net, I have no idea what they are because ID is so difficult.

131

00:22:00.090 --> 00:22:06.570

Sam Droege: You can see, and I believe Denise has linked to the top of the page a series of.

132

00:22:07.380 --> 00:22:14.760

Sam Droege: YouTube videos I don't know where might be up by 1718 videos just on identifying North American bees to genus.

133

00:22:15.090 --> 00:22:30.900

Sam Droege: let alone, two species so we'll probably have 100 hour long videos on be identification because it's so tricky so I encourage people to look at that the lethality issue there's a whole other set of things to consider both on the pro and a con.

134

00:22:32.400 --> 00:22:48.720

Sam Droege: side of things, but in a in a information conservation point of view, we have to end up, at least in some of the kinds of investigations looking at what amounts to dead bees so that's the small.

135

00:22:49.950 --> 00:22:58.650

Sam Droege: Discussion of a much larger topic so i'm going to move on, we can you know, bring this topic back up but I don't want Denise to cut me.

136

00:22:58.650 --> 00:22:59.820

Sam Droege: off from all these good.

137

00:23:01.290 --> 00:23:04.500

Sam Droege: context, so we now have these.

138

00:23:05.700 --> 00:23:15.090

Sam Droege: So bees in a in a a centrifuge tube and we're going to process them in a bit, but i'm going to show you one of the other main.

139

00:23:15.690 --> 00:23:24.960

Sam Droege: capture techniques that are used quite a bit and essentially Oh, let me back up, so this is a new gizmo innovation, which is.

140

00:23:25.350 --> 00:23:36.930

Sam Droege: A very simple thing that's a four inch I think that's a four inch tube I can fit my hand in there i've got a binder clip and i've got a ziploc bag so.

141

00:23:37.320 --> 00:23:43.560

Sam Droege: And to see can make a good non lethal approach to some extent to so what i'm going to do.

142

00:23:44.250 --> 00:23:55.650

Sam Droege: Is do just what I was talking about i've got a net full of bs there at the bottom, instead of picking them all out and putting them directly into a soapy container i'm going to have let me set this up.

143

00:23:57.180 --> 00:24:21.810

Sam Droege: pretend bs though and i'm going to take the tube so this you know, this could be a rolled up piece of cardboard, it could be anything like this, this is just happened to be something we had around that I didn't have to buy and you take your ziploc bag okay very clumsily and.

144

00:24:22.830 --> 00:24:27.750

Sam Droege: In elegantly take your binder clip and you just right take the binder clip.

145

00:24:29.280 --> 00:24:30.750

Sam Droege: And again.

146

00:24:32.130 --> 00:24:40.110

Sam Droege: Trying to do this on national YouTube TV and messing up, so there it is it's just tucks it in i've got it like this.

147

00:24:40.680 --> 00:24:56.700

Sam Droege: Okay, I would have it on the ground or on top of the car or on a table i've caught a bunch of bs okay now what I want to do is get the bees into this ziploc bag, while they're alive, and so what i'm gonna do is i'm going to put this on its side.

148

00:24:58.380 --> 00:25:07.920

Sam Droege: i've got the bag here i'm going to to let's see if I can do this i'm going to invert it right so i've not been stung doing this, but.

149

00:25:08.460 --> 00:25:19.380

Sam Droege: You can get nervous when that bag is full of bumblebees, which is part of our standard Bumblebee survey technique for non lethal Bumblebee sampling and i'm not showing you the entire.

150

00:25:20.490 --> 00:25:29.730

Sam Droege: Fast way to do this, but i'm going to see might have a glove on is all i'm saying you're going to stick your hand and a bag in there now i'm inside the.

151

00:25:30.750 --> 00:25:42.300

Sam Droege: Inside the plastic bag i've got the bag it's still inverted and i'm going to pull it off my hand by pulling it backwards, that is, releasing all the bs and whatever else is in there you.

152

00:25:42.480 --> 00:25:44.700

Denise Ellsworth: Know up just a little bit we're very good.

153

00:25:44.850 --> 00:25:54.810

Sam Droege: At this bag, so now every there's all kinds of stuff flying around around i'm going to wave this madly around to get everything to the bottom.

154

00:25:55.170 --> 00:26:02.550

Sam Droege: Of the baggie and i'm just going to pull that bag off and i'm going to just hold the top shut get rid of the binder clip.

155

00:26:03.000 --> 00:26:06.240

Sam Droege: And, with a little fucking around like now i've got them zip locked in there.

156

00:26:06.990 --> 00:26:15.960

Sam Droege: If I really clever it have a note in pencil inside already now I can now very much for conveniently then Internet look at what i've caught.

157

00:26:16.200 --> 00:26:26.760

Sam Droege: So for a Bumblebee survey, this is our standard protocol now you simply look at the bumblebees in there and divine what the species Arc and then you let him go.

158

00:26:27.630 --> 00:26:33.630

Denise Ellsworth: Am I want to mention the zip net instructions that you have in the handy manual because I modified my.

159

00:26:34.500 --> 00:26:37.620

Denise Ellsworth: My student nets, as if nets and so when i'm out in

the field.

160

00:26:38.100 --> 00:26:50.760

Denise Ellsworth: With people they have the ziploc bag at the bottom of the net and the same thing that you were talking step not quite the tube and inversion the fees are right there in that bag it's really great for kids or people who are a little nervous about catching bees.

161

00:26:51.330 --> 00:26:52.020

Sam Droege: And so.

162

00:26:53.250 --> 00:26:58.860

Sam Droege: So if you have a modification send it to me, so I can put in the next version, the handy be manual which we're working or you don't.

163

00:26:59.730 --> 00:27:00.270

Sam Droege: I do think.

164

00:27:00.420 --> 00:27:01.890

Denise Ellsworth: I do use what you recommended yeah.

165

00:27:01.980 --> 00:27:03.720

Sam Droege: Okay, so here.

166

00:27:04.770 --> 00:27:14.430

Sam Droege: So this, then I can now take this off as I could, with the modified net which a lot of people don't bother to do that because that's a lot of extra work, and I can.

167

00:27:14.970 --> 00:27:24.750

Sam Droege: Have a tag inside paper and pencil I can put it in the freezer and now I can look at those samples later so we're using freezers, as our.

168

00:27:25.200 --> 00:27:35.580

Sam Droege: main storage container we're actually most of time, not even using alcohol or propylene glycol for any kind of storage it's just freezer work so, but this also could have been filled with.

169

00:27:36.150 --> 00:27:43.920

Sam Droege: Some alcohol or propylene glycol to save a sample or you can just use it to visually look at what you have and release them.

170

00:27:44.340 --> 00:27:55.740

Sam Droege: You could take pictures, but I can tell you that this often will fog up and it's just not a great photography thing you can do things like have a puter, which is a.

171

00:27:57.060 --> 00:28:02.910

Sam Droege: look it up, it allows you to suck insects, out of small areas and into a vial.

172

00:28:03.960 --> 00:28:11.850

Sam Droege: We don't actually use them, but you can do that, then you can pull out which insect you want my sneaking that in there and moving it to a vial.

173

00:28:12.930 --> 00:28:22.110

Sam Droege: But it gives you several options, including a lot of non lethal stuff we use it for mumble be surveys, particularly in bombus happiness areas where you know we can't.

174

00:28:24.090 --> 00:28:27.360

Sam Droege: make a mistake of killing a bombus happiness by accident.

175

00:28:28.380 --> 00:28:45.390

Sam Droege: it's surprisingly difficult, even in a net to tell whether you have bombus happiness or not so that's netting things I want to talk now about bowls so we there's lots of different ways to do this, basically, you have a white a.

176

00:28:46.500 --> 00:28:55.050

Sam Droege: So a white a yellow a blue those three color combinations maximize the spectrum of attraction for bees.

177

00:28:55.710 --> 00:29:06.330

Sam Droege: We put those out in different kinds of combinations they're filled with soapy water always we always tell people to use not and the government is not.

178

00:29:06.930 --> 00:29:19.050

Sam Droege: championing this commercial product dawn blue dawn because it's so available and has not a citrus scent it as a duck scent apparently but the.

179

00:29:19.710 --> 00:29:34.170

Sam Droege: Reason is citrus oils are repellents for insects, and we have shown through some of our student products that the using a citrus based detergent decreases your cache file a lot.

180

00:29:35.070 --> 00:29:54.630

Sam Droege: We have several other bowl innovations, but our problem right now is this is the only kind of bowl usually can get in those sizes in general, those are 3.25 ounce Deli cups using me by solo but other manufacturers translucent paint does not like to stick to that this is our favorite.

181

00:29:56.490 --> 00:30:10.470

Sam Droege: primer there by Russell i'm very available almost every hardware store covers it we've tried a ton of others, this works, the best again we're not advocates for Russell him.

182

00:30:11.910 --> 00:30:24.480

Sam Droege: And we use from Barbara paints, which is in the handy be manual a fluorescent yellow and a fluorescent blue pigment we mix them into the primer directly and.

183

00:30:25.200 --> 00:30:35.430

Sam Droege: Usually strain them out because this this pigment is clumpy if we're going to put it in a blower and a paint gun, but you can just paint them.

184

00:30:36.630 --> 00:30:44.100

Sam Droege: there's some more nuance There we have unpublished studies that show that if you paint the inside of these bowls.

185

00:30:44.400 --> 00:30:54.600

Sam Droege: That some bees will climb out because they now get a grip, but if you have painted the outside of the bowls that color the inside, is so smooth that nobody's get out.

186

00:30:55.050 --> 00:31:07.860

Sam Droege: So you'll hear about that, I encourage you, through the links that or emailing me that you join our be monitoring listserv if you're into this sort of thing because we'll make announcements.

187

00:31:08.700 --> 00:31:15.990

Sam Droege: about these techniques and there's you know chatter about survey techniques and ids and the mundane of.

188

00:31:19.200 --> 00:31:21.150

Sam Droege: of how to so.

189

00:31:21.570 --> 00:31:26.340

Denise Ellsworth: Sam there's a little bit of interference in the background, you have a video going or maybe it's just a conversation.

190

00:31:26.850 --> 00:31:27.570

Sam Droege: People going.

191

00:31:27.870 --> 00:31:29.730

Denise Ellsworth: Oh God there's work happening.

192

00:31:31.080 --> 00:31:34.770

Sam Droege: Okay, so I told them, you know I told him I was going to fire them.

193

00:31:34.920 --> 00:31:35.190

Sam Droege: If they.

194

00:31:36.030 --> 00:31:38.490

Sam Droege: Thank you that's how we roll here but.

195

00:31:40.020 --> 00:31:50.100

Sam Droege: So when you have these bowls traditionally there and they handed vignette manual I think largely talks about that he would dump the balls.

196

00:31:50.490 --> 00:32:01.620

Sam Droege: into any brine shrimp net brine shrimp has smaller holes than regular ones, and then you have to extract them and put them in another bag short cutting several.

197

00:32:02.490 --> 00:32:13.500

Sam Droege: Things you can add easier, one is to us what our paint filters, and these are used by automotive paint people, you can buy tons of them.

198

00:32:14.100 --> 00:32:24.090

Sam Droege: In bulk and there's a tiny screen at the bottom and you want the largest mesh size, which I think is the larger smaller number.

199

00:32:25.080 --> 00:32:38.670

Sam Droege: On these because it's so find that often will be slow, you can dump your bowls into these you're going to write on here in pencil but this paper does deteriorate, so you want another tag which we'll talk about in a second.

200

00:32:39.750 --> 00:32:48.180

Sam Droege: And then you just fold this up and if you're nearby you simply fold it over on top staple it and.

201

00:32:48.570 --> 00:32:57.060

Sam Droege: put it into a container just an open container and then take everything and put it in the freezer not into any more liquid.

202

00:32:57.540 --> 00:33:04.950

Sam Droege: or a plastic bag and the bees will have partially dried out and will be a very nice specimen in that way.

203

00:33:05.580 --> 00:33:20.610

Sam Droege: The if you get things out of liquid and dry and process and within 24 hours your your specimens will be Primo any longer than that a hair's become very matted, no matter what i'm not sure why something about the hairs there.

204

00:33:21.600 --> 00:33:34.260

Sam Droege: But our latest thing is that we use where's an empty bag Oh, here we go, so one of our volunteers, is very good at the sewing machines, we take mosquito netting.

205

00:33:34.740 --> 00:33:45.510

Sam Droege: And I mean this is something anyone who knows how to do something, this is like sewing 101 is you make a bag, with a drawstring on it so in the field.

206

00:33:46.350 --> 00:33:57.180

Sam Droege: You take a flower pie, or you take whatever kind of container like here, you can see, this container which had some mysterious commercial product in it.

207

00:33:57.660 --> 00:34:16.470

Sam Droege: And then you drill holes in the bottom you dump so the drawstring is over the top, you just dump into this your specimens then at the end you pull it and you tie off the bag and you wrap it up, and you, but before you do that, you add a.

208

00:34:17.850 --> 00:34:23.220

Sam Droege: specimen tag that you written out in pencil and we can send these to you.

209

00:34:24.330 --> 00:34:40.710

Sam Droege: But one of our problems when we work with people in particularly if we're asking them to do things is they send us mysterious notes with their data on paper that we swear they wrote it on toilet paper and is now just pulp so.

210

00:34:41.790 --> 00:34:54.300

Sam Droege: Tough paper a standard form by whatever your project is and you want all that information like latitude and longitude lots of redundancy, because I can tell you that.

211

00:34:54.960 --> 00:35:11.820

Sam Droege: All of your participants will mess this up in so many ways, so you want to eliminate that, by giving them the forms not telling them what to write and then that form gets cut out added to the bag and then brought back to the laboratory.

212

00:35:12.900 --> 00:35:22.140

Sam Droege: We then your some assessments, we then do something like this i'll just use one bag as an example.

213

00:35:23.610 --> 00:35:31.020

Sam Droege: We will have a bag now and we throw this into the freezer

immediately Okay, when we come back to the lab We then pull out the tag.

214

00:35:31.560 --> 00:35:45.450

Sam Droege: And we had the tag now to a petri dish that is not an ordinary if you did it is a petri dish with a set of colored rhinestones glued to the bottom.

215

00:35:46.200 --> 00:35:54.090

Sam Droege: And those colored rhinestones are matching a set of colored rhinestones in this bag at this point and.

216

00:35:54.630 --> 00:36:07.260

Sam Droege: We then take a series these bags throw them into the freezer until we have a bunch I take them home I throw them the laundry machine I run them through a delicate cycle I bring them back, we have a little mini dryer.

217

00:36:07.740 --> 00:36:27.150

Sam Droege: Like desktop apartment dryer and then we throw them in the dryer somewhere between 10 minutes seven minutes to 15 minutes depending on size amount and number of bags and we have beautiful specimens that are bouncing around inside the bags fluffing their.

218

00:36:28.710 --> 00:36:30.300

Sam Droege: lovely bodies and.

219

00:36:31.320 --> 00:36:32.250

Sam Droege: We don't have.

220

00:36:33.270 --> 00:36:39.330

Sam Droege: Like we do, which i'll show you in a second if you're doing individual specimens problems with.

221

00:36:43.050 --> 00:36:45.270

Sam Droege: People short cutting the drying process.

222

00:36:46.530 --> 00:36:47.280

Sam Droege: So.

223

00:36:48.510 --> 00:36:52.860

Sam Droege: The traditional way would be canning jar.

224

00:36:53.940 --> 00:36:58.680

Sam Droege: screen on top usually fiberglass screen cheap from the hardware store.

225

00:36:59.160 --> 00:37:10.050

Sam Droege: And you can glue it or you can just simply clamp it down there specimens go in and then you use a hairdryer which you know what that looks like or a big blower.

226

00:37:10.500 --> 00:37:24.450

Sam Droege: and dry it by hand while shaking the JAR so the specimens are bouncing across the screen you want them to have their hair tell sold you don't want a bunch of matted hair on the ground, so you want active.

227

00:37:26.760 --> 00:37:27.690

Sam Droege: processing.

228

00:37:28.950 --> 00:37:40.920

Sam Droege: These are slightly better so PVC pipe fits together screen on the bottom glued with pipe glue which will glue the fiberglass stuff on to.

229

00:37:41.550 --> 00:37:54.690

Sam Droege: You put them together specimens are in there you blow through there there's a lot of more airflow and bouncing around be careful, you can do that too much and pull off a lot of terms of laws.

230

00:37:57.300 --> 00:38:00.480

Denise Ellsworth: Within, let me just jump in I wanted to mention to everyone and that.

231

00:38:00.540 --> 00:38:14.310

Denise Ellsworth: I will record and post the chat i'll copy and paste the chat on to our recording page so folks are trying to figure out how to copy it I can't enable a setting that lets you copy the chat but I will post that for you.

232

00:38:16.050 --> 00:38:34.410

Sam Droege: We we do that for like if we have a special batch we want to look at the bs right away now but largely we're going to the net bag thing because it's so much more convenient and each of these steps can be and should be put into the freezer so afterwards we end up with a.

233

00:38:35.550 --> 00:38:47.160

Sam Droege: This is empty we end up with a petri dish usually we tape it so it doesn't open up and after it gets jostled with the label reconnected with the dried specimens.

234

00:38:47.910 --> 00:39:04.080

Sam Droege: We put them in the freezer so they don't completely dry out and then, when someone comes into the lab they know they can pick up this set of specimens and process them and they're because they're in the freezer they're still fresh enough to pin and we do a lot of gluing.

235

00:39:05.460 --> 00:39:18.240

Sam Droege: So I think i'm going to now go on to the process of pinning i'll say that we keep track of each collection event and give it a separate number.

236

00:39:18.570 --> 00:39:26.490

Sam Droege: So, every time I or anyone else goes out does a set of bull traps at a different location time and place it gets its own number.

237

00:39:26.820 --> 00:39:41.490

Sam Droege: you'll find it ultimately that's very useful to do, rather than simply numbering each individual be and tracking that somewhere else, so we have two numbers a be number unique a collection event number also unique.

238

00:39:42.540 --> 00:39:44.640

Sam Droege: a useful addition so.

239

00:39:45.660 --> 00:40:06.450

Sam Droege: penny wise, let me say that we have for years now use this brand of pins government does not advocate this brand depends as a government but Sam does because they are super cheap home tools way cheaper than as far as I can tell all the other brands so.

240

00:40:08.430 --> 00:40:16.530

Sam Droege: that's useful, we have some reuse little holders for pins, but what we do is.

241

00:40:18.420 --> 00:40:29.370

Sam Droege: First of all, let me show you why we use pencil This is our classic that's in the bathroom this is someone send us in a whole bunch of specimens they are in alcohol and they had filled it out in pen.

242

00:40:29.880 --> 00:40:40.380

Sam Droege: There were words in different lovely lovely different colors in there sharpie or whatever it was they're all gone and.

243

00:40:41.250 --> 00:40:54.240

Sam Droege: People will write on the outside of labels no sharpies allowed sharpies do not really perform well with plastic and with alcohol, in particular, and sometimes not even with propylene glycol.

244

00:40:54.600 --> 00:41:03.120

Sam Droege: it's a all pencil thing if you want, you can write something on the outside of the bag, but there has to be a pencil label inside.

245

00:41:04.380 --> 00:41:07.650

Sam Droege: And so we use.

246

00:41:08.700 --> 00:41:10.410

Sam Droege: Cross linked at the phone.

247

00:41:11.580 --> 00:41:23.580

Sam Droege: Which in any large city you'll have a phone manufacturing plant and they'll do whatever phone you want cross linked at the phone we use dark ones, so it doesn't show how dirty everything is.

248

00:41:24.750 --> 00:41:27.720

Sam Droege: And sometimes they have overruns and they'll just.

249

00:41:28.860 --> 00:41:38.340

Sam Droege: Re cut their runs because they when they're manufacturing apparently they're doing everything like in three foot thick intervals they'll recut it to what you want.

250

00:41:38.850 --> 00:41:51.450

Sam Droege: Three eighths inch is your diameter and then we glue that to lots of things So the first thing i'm going to show is that, for some reason, these signs.

251

00:41:52.170 --> 00:42:06.750

Sam Droege: which were along highways illegally ended up in our lab and then we glue them to the back so with cross linked epiphone unlike styrofoam you can use white glues, but you have to wait them down mostly we are using.

252

00:42:10.500 --> 00:42:25.050

Sam Droege: Hotmail glue guns get a good one because they will come up if you don't and we are using construction grade glue not the crafty stuff which is basically just melted plastic and will eventually crack off.

253

00:42:27.960 --> 00:42:32.670

Sam Droege: Anyway, so this is our one of our worksheets we use.

254

00:42:33.690 --> 00:42:43.710

Sam Droege: parchment paper with reuse over and over again on here because glue doesn't stick to it, and I can literally move the specimens with my hand wherever I want.

255

00:42:43.980 --> 00:42:54.060

Sam Droege: I don't have time to show you are sorting but will line up the specimens out of that bag in a line down here, and then I with my finger some people use tweezers.

256

00:42:54.510 --> 00:43:12.960

Sam Droege: But I move my fingers one side or bees other support these are things I think could be bees so it's always important to be conservative and other things go to the others way or not be not be going away in our lab and then the bees get process to pinning or two.

257

00:43:13.980 --> 00:43:29.010

Sam Droege: gluing if we're gluing we're gluing This is our gluing

sheet to, and you can see things on here that say, do not pin through the sheet so and that's just one of these it's a tip so right so.

258

00:43:29.550 --> 00:43:44.550

Sam Droege: That, if you start pinning through this, then it attaches those little pinholes catch on the little tiny legs, and so it ruins them you pinned to the side if you need to and then things are glued on the sheet and.

259

00:43:45.630 --> 00:43:52.860

Sam Droege: We have videos on this, but basically we are using a glue similar to this a tacky glue.

260

00:43:53.880 --> 00:43:59.430

Sam Droege: That upside down yeah khaki glue one of the ones look for archival quality and.

261

00:44:01.080 --> 00:44:04.110

Sam Droege: You can use white glues particularly again.

262

00:44:05.460 --> 00:44:18.810

Sam Droege: glues at our archival our PCs but they often don't completely dry crystal clear these dry crystal crystal clear, which is helpful when you're trying to see through the glue if there was a.

263

00:44:19.950 --> 00:44:25.950

Sam Droege: You know glue got smeared in a place you didn't want to see it, so this type is what we're using.

264

00:44:27.390 --> 00:44:33.720

Sam Droege: We will open it up we'll run a line of glue down our thumb or a forefinger.

265

00:44:35.310 --> 00:44:39.810

Sam Droege: That sounds bad align a glue and then we will take a pin.

266

00:44:40.800 --> 00:44:52.650

Sam Droege: pretend, this is a pin and we will touch the pin to the glue line at the level we want the specimen we will go back to our sheet touch the the.

267

00:44:53.100 --> 00:45:08.520

Sam Droege: Be on its side or underneath never on top, and then we set it aside in lines to dry on that sheet and then in about 15 minutes to whatever later we can pick them up and move them to boxes when we do that.

268

00:45:09.630 --> 00:45:10.140

Sam Droege: here's.

269

00:45:11.820 --> 00:45:19.230

Sam Droege: What things look like, first let me talk about boxes, so we use pizza boxes and we brought on our third.

270

00:45:20.370 --> 00:45:26.010

Sam Droege: pallet load of these things, it turns out that if you use the standard.

271

00:45:28.530 --> 00:45:37.230

Sam Droege: Bio quip box which a lot of people use it's a lot taller Okay, so it takes a lot more shelf space, it also is equally.

272

00:45:37.800 --> 00:45:52.920

Sam Droege: prone to getting insects which climbed through that which we'll talk about in a second, and it is expensive, this is a lot less expensive, you can actually you're not doing a lot just bump them off of pizza people and.

273

00:45:54.180 --> 00:46:09.570

Sam Droege: or eat pizza carefully and then you remove the top because you don't want that attached top because it gets in the way when you start spreading things out so you cut it off, you get rid of one of the tabs and then you have phone.

274

00:46:11.700 --> 00:46:17.550

Sam Droege: Like no glued to the interior with areas to either side that the.

275

00:46:18.720 --> 00:46:29.220

Sam Droege: lids of the edges of this will fit in You then have this situation okay here's a collection event label and here's a series of specimens that are now.

276

00:46:30.120 --> 00:46:39.630

Sam Droege: In some combination of pinned and drop and glued next to it, we do rows of 10 so it's easy to count right so because we're going to.

277

00:46:40.350 --> 00:46:54.360

Sam Droege: assign each of these labels, with a collection event number and then we're going to assign numbers to each of these, but we have to count them, so another tip Rosa 10 makes everyone's life a lot easier versus.

278

00:46:54.750 --> 00:47:15.360

Sam Droege: You know, big pile jumbles of specimens these are our labels now printed out here, and again this then becomes part of the workflow this fox will go through our system together someone because we have lots of volunteers can come in and they can associate the.

279

00:47:16.590 --> 00:47:26.250

Sam Droege: The group of labels to the specimen to the collection event number cut them out with very small craft scissors so.

280

00:47:27.960 --> 00:47:40.290

Sam Droege: These kinds of scissors are super handy and so they'll cut them out and label them when we're cutting out specimens we will cut a line of labels, let me show that better.

281

00:47:42.390 --> 00:47:43.770

Sam Droege: So much to cover here.

282

00:47:45.810 --> 00:47:48.180

Sam Droege: there's a set of labels as often are.

283

00:47:49.230 --> 00:47:57.360

Sam Droege: You know, however, you generate and we've look something like that we cut them into strips we put a strip down in another box.

284

00:47:57.990 --> 00:48:05.790

Sam Droege: We move the collection event label with it, so that that helps track things, then we put the specimens in.

285

00:48:06.540 --> 00:48:25.110

Sam Droege: on the label, with the head towards the matrix on the same row but it's not cut then we'll either on a row, at a time or two rows of time take those little scissors dive into the foam and cut them in place one less move that we have to do and it's fast.

286

00:48:27.330 --> 00:48:33.660

Denise Ellsworth: And Sam, just to clarify you're doing lots and lots of samples right you're processing hundreds and.

287

00:48:33.720 --> 00:48:37.170

Sam Droege: Hundreds of being said, this is, this is our workflow.

288

00:48:37.620 --> 00:48:47.160

Sam Droege: And that's why the chat thing is useful, like we're showing you where we you know our lab motto is how do we increase our bees per minute.

289

00:48:48.240 --> 00:49:07.080

Sam Droege: So we lots of these little things make less work for us in the aggregate because we're doing thousands and thousands of specimens and it may be that, at the level of an individual it's not so important, but on the other hand, most of this could be done at that level.

290

00:49:07.860 --> 00:49:18.690

Denise Ellsworth: Before you move on, there were a couple questions related to processing those specimens how long can the bees stay in soapy water and how long in the freezer before you need to take them out and process them.

291

00:49:19.380 --> 00:49:21.030

Sam Droege: So in the freezer it's indefinite.

292

00:49:22.080 --> 00:49:33.180

Sam Droege: And soapy water outside okay or in your vile surprisingly long periods of time Jane who is our West Virginia volunteer would put.

293

00:49:33.930 --> 00:49:46.680

Sam Droege: cottage cheese bowls that she painted out for two weeks in

the summer come back and, yes, they smelled but they actually process pretty well so it's amazing long time they will.

294

00:49:47.640 --> 00:49:54.990

Sam Droege: You know, essentially they're going to start decomposing but the kindness and testament is actually pretty tough so.

295

00:49:56.430 --> 00:50:11.760

Sam Droege: But in general it's good to if you have the time to process some within 24 hours or less because you get good looking best the best looking specimens that way you don't if you are precise about how you wash and dry things.

296

00:50:12.660 --> 00:50:23.820

Sam Droege: We can talk about propylene glycol because it's a special case, if people are doing that, but you, you need to be good at washing and drying or your specimens look terrible you never want to go.

297

00:50:24.150 --> 00:50:32.880

Sam Droege: here's a bunch of specimen soapy water sticking pins in them and putting them as your final product, because they will look terrible the.

298

00:50:33.270 --> 00:50:49.650

Sam Droege: hairline matted it'll be discolored because it's matted the wings will inevitably become glued to the side of the body and it just makes identification terrible and aesthetically like who wants to look at that, so does that answer.

299

00:50:49.950 --> 00:50:58.050

Denise Ellsworth: Yes, it does, but can you do your quick elevator version of how many bees, there are per acre because there are a couple questions about why are we killing native bees and.

300

00:50:58.260 --> 00:51:00.600

Denise Ellsworth: Are there enough bees to be doing this.

301

00:51:00.660 --> 00:51:07.230

Sam Droege: yeah so we have done, we have lots of information, and I can send the excel spreadsheet that shows how we approach this but.

302

00:51:07.830 --> 00:51:19.980

Sam Droege: Our back of the envelope calculation is the average acre in the mid Atlantic states, so this be appropriate for Ohio is that an average acre is producing on that acre about 26,000.

303

00:51:20.550 --> 00:51:30.660

Sam Droege: Bees we really intersect with them relatively rarely so even going out and trying to capture them is very inefficient.

304

00:51:31.170 --> 00:51:44.430

Sam Droege: Compared to the numbers that are out there, a lot of these bees are out for only small periods of time together they're pulling in their back in the nest they're hard to find hard to see they fly different distances so it's very difficult to.

305

00:51:46.020 --> 00:51:51.750

Sam Droege: almost impossible really to collect out a population of bees so.

306

00:51:52.500 --> 00:52:03.090

Sam Droege: When we're sampling and we go like oh my God I got 1000 bees on my project like that's a drop in the bucket and there's also a whole series we're not talking about a moral.

307

00:52:03.780 --> 00:52:14.610

Sam Droege: You know I have morally opposed to killing animals we're talking about a biological impact in later populations like are we harming.

308

00:52:14.880 --> 00:52:28.410

Sam Droege: These populations and the answer is no, because we can't catch enough bees to have an impact on the next generations, when we catch these of chunk of them are males so males are not monogamous so.

309

00:52:29.130 --> 00:52:39.450

Sam Droege: there's always pretty much enough males to get the meeting done and actually an unrated female will just make more males because a male is an unfertilized egg.

310

00:52:40.200 --> 00:52:53.730

Sam Droege: To when we're catching females, because of the way the

average solitary bee is working, which is almost all the bees she makes a series of nestle's lays eggs into those nests and.

311

00:52:54.300 --> 00:53:05.880

Sam Droege: seals it off and then she has no more interaction so, on average, she would have produced, about half of her next year's offspring too so biologically again, not a moral.

312

00:53:06.900 --> 00:53:11.370

Sam Droege: inquiry here biologically we really have no impact.

313

00:53:11.970 --> 00:53:26.400

Sam Droege: From a statistical scientific point of view, because there's so many bees out there and we want to understand what they're doing how they're doing what the species are you end up you want to catch lots of bees and.

314

00:53:26.970 --> 00:53:41.580

Sam Droege: To understand what the species are that right now means they have to be killed in some way, so the lethality of a lot of these techniques is sad, I would say, and I feel that but it's.

315

00:53:42.600 --> 00:53:50.070

Sam Droege: You know if your goals are really to help these bees, you have to know what's out there, and right now we're stuck with a week old fix.

316

00:53:51.480 --> 00:53:51.930

Sam Droege: how's that.

317

00:53:52.920 --> 00:53:54.360

Denise Ellsworth: it's good Thank you okay.

318

00:53:54.840 --> 00:53:55.440

So.

319

00:53:56.790 --> 00:54:06.630

Sam Droege: Continuing on with processing so once once they're labeled then we, I want to show you that the process they're labeled.

320

00:54:07.470 --> 00:54:15.960

Sam Droege: will have people in the lab who may not know anything about these more so sort them so that helps with the identification ultimately because.

321

00:54:16.680 --> 00:54:34.470

Sam Droege: All the big bees, will be in one place, and you have fewer moves that the identifier, who is the weak link in almost all the systems it's easy to collect these really pretty good with bold traps, but someone has to still struggling vacation so anything that can be.

322

00:54:36.240 --> 00:54:53.460

Sam Droege: used to shortcut That is good, so a lot of times we collect the entire collection of all the bs from a project, and then the interns and the students and the technicians will more Fo sort those and then they're given to either Claire or myself to ID and that's a big.

323

00:54:54.570 --> 00:54:56.100

Sam Droege: Big boost in our productivity.

324

00:54:57.180 --> 00:55:04.080

Sam Droege: So, ultimately, what you end up is with a box that might look something like this.

325

00:55:04.710 --> 00:55:23.520

Sam Droege: So what you're seeing it are maybe not well our specimens and a specimens where the label is vertical those are females, so we don't again we're busy so anything that we can do so having to separate out males and females or write their names out.

326

00:55:24.150 --> 00:55:31.770

Sam Droege: is a waste of our time well it's it's time consuming and then horizontal are males.

327

00:55:32.280 --> 00:55:52.620

Sam Droege: And so, and then in front reading like a book right to left top of the bottom is a label that identifies what the species is so it gives it a name and then whoever and it's not under the specimen so traditionally you would put the debt label it's called under the specimen and.

328

00:55:53.880 --> 00:56:09.360

Sam Droege: But it's hard if you're doing data entry to read that in the old days, no one did data entry you just put them into unit trace so here, you have the debt label and then the person who's doing data entry and you can see there's a.

329

00:56:10.440 --> 00:56:17.070

Sam Droege: A qr code or matrix code on each label, maybe it's hard to see, but there is and so.

330

00:56:18.570 --> 00:56:30.690

Sam Droege: Probably not something most people are doing, but if you're part of a larger group, you would be probably wanting to do this is You then have a simple scanner.

331

00:56:33.240 --> 00:56:52.020

Sam Droege: That we buy used, and you can scan those codes right in so you don't make mistakes typing and six digit numbers which is inevitable, and then we have a whole process of I can show you our our stalking routines and things like that for data entry and double double checking.

332

00:56:53.730 --> 00:56:55.350

Sam Droege: Part of.

333

00:56:56.610 --> 00:57:04.590

Sam Droege: Some of these processes is going back or during the labeling process and saying you know that's best man that needs to go the smithsonian.

334

00:57:04.890 --> 00:57:15.870

Sam Droege: that's best man, it needs to go into our collection that's best man needs to go to so and so for more ID or for some kind of confirmation or a special project.

335

00:57:16.560 --> 00:57:32.250

Sam Droege: So you can use different colored pins with pieces of paper on them to stick back into your collections that might be Oh, take a picture of this or this or something's going to be done so we use these and also.

336

00:57:32.760 --> 00:57:44.820

Sam Droege: You know little stick pins of different kind to mark specimens in boxes, so that we don't don't overlook them if it's their special for some reason.

337

00:57:48.750 --> 00:57:58.290

Sam Droege: Just we were talking about those jewels we keep our our jewels in little containers, so that they can be refound very quickly.

338

00:57:59.730 --> 00:58:00.570

Sam Droege: We have.

339

00:58:03.330 --> 00:58:12.480

Sam Droege: microscope stuff we bind microscopes us there's not one microscope in the lab that wasn't purchased us are given to us from some.

340

00:58:13.860 --> 00:58:20.340

Sam Droege: Some other group they are very sturdy so use microscopes are a good value.

341

00:58:21.270 --> 00:58:32.100

Sam Droege: And so, if you go online to use scientific equipment dealers, they have to deal with reputational things so we've never had a bad purchase.

342

00:58:32.910 --> 00:58:42.300

Sam Droege: Right now we're fine because we get these things for free my suggestion is to look for microscopes if you're going that route, which I always encourage people to do online.

343

00:58:43.860 --> 00:58:49.080

Sam Droege: There are often very expensive lights, but we use.

344

00:58:50.220 --> 00:58:53.250

Sam Droege: Different combinations, this is the Lawrence packer lab.

345

00:58:54.480 --> 00:59:09.750

Sam Droege: approach, which was prior to LEDs and they I think they still use them, this is a just a gigantic compact fluorescent of like 150 equivalent Watt bulb and on a.

346

00:59:10.830 --> 00:59:18.900

Sam Droege: On a you know standalone light extra weight, so it doesn't topple over also you have to make sure the bell is.

347

00:59:20.040 --> 00:59:26.280

Sam Droege: Is ventilated because a compact fluorescent of this size will produce a lot of heat at the base.

348

00:59:27.690 --> 00:59:37.890

Sam Droege: it's clunky, though, and you often have to put in shading what most people, I think, are going to if I think they have any sense is.

349

00:59:38.550 --> 00:59:57.060

Sam Droege: This again there's other ways, but Ikea has these kinds of student lamps have different kinds of have to on them and they're these were 10 bucks right, and so this is basically all we use now I can looseness neck this to wherever I want in terms of the angles.

350

00:59:58.170 --> 01:00:01.470

Sam Droege: Under microscope we're used to usually because it gives better light.

351

01:00:02.610 --> 01:00:03.150

Sam Droege: In.

352

01:00:06.660 --> 01:00:08.730

Sam Droege: A long time ago I.

353

01:00:10.470 --> 01:00:17.220

Sam Droege: realized that the flashlights the led flashlights that were coming out were.

354

01:00:20.010 --> 01:00:29.130

Sam Droege: actually produce really good light, so this, you can see here is a very cobbled together system, I have a botany.

355

01:00:30.810 --> 01:00:47.400

Sam Droege: Far reach thing so it's right next to my desk so I can pivot this back and forth so just had a, this is a weighted stand that

was used for botany thing it had a different scope on it, which i've jam, together with pieces of foam on here is a gerber.

356

01:00:48.690 --> 01:00:59.910

Sam Droege: rei know 20 years old now light that I wired together in some cobb job way with.

357

01:01:00.960 --> 01:01:11.820

Sam Droege: One of those little wall cube converters, so you can look at the batteries figure out the voltage find a converter somewhere that matches that, and you can make it into an electric light.

358

01:01:12.870 --> 01:01:21.630

Sam Droege: The Ikea lights replace those, but this is still a totally good light, for me, and it was also becomes portable right so.

359

01:01:22.710 --> 01:01:24.300

Sam Droege: there's another tip.

360

01:01:27.060 --> 01:01:28.140

Sam Droege: laptop over.

361

01:01:29.610 --> 01:01:34.650

Denise Ellsworth: CMU hardly taken a break, so I breath, that is, so I can't even get in I was going to give you a five minute.

362

01:01:36.780 --> 01:01:38.370

Denise Ellsworth: 62nd warning so.

363

01:01:39.450 --> 01:01:45.810

Denise Ellsworth: So a lot of the questions in the chat box we've kind of answered as we went i'll keep looking at those questions.

364

01:01:47.160 --> 01:01:58.140

Denise Ellsworth: But some of the concerns from some of the participants was these are pretty advanced things are there, simple things, how do I, how do I know how do I get how do I bridge this, how do I get started.

365

01:01:59.550 --> 01:02:00.480

Sam Droege: Well, so.

366

01:02:02.670 --> 01:02:11.910

Sam Droege: You know the basics are a net and some viral with soapy water, I would say, you know as a starter thing the.

367

01:02:15.000 --> 01:02:23.970

Sam Droege: Then to wash and dry your specimens is just that canning jar with the screen on top, and a blow dryer so.

368

01:02:24.480 --> 01:02:40.350

Sam Droege: that'll get you, you need to buy some pins and then you can put them in all kinds of boxes, we suggest getting you know, doing the epiphone thing or you can just again if you're just starting out and you have some money just by the bio quit boxes be aware, though, that.

369

01:02:42.090 --> 01:02:50.310

Sam Droege: One mice love specimens so you should put them into a mouse free environment, you can also.

370

01:02:51.660 --> 01:03:00.000

Sam Droege: there's domestic beetles and a couple other things, but mostly domestic beetles will attack these dried specimens inevitably and you can.

371

01:03:01.770 --> 01:03:14.160

Sam Droege: Use you we just we allow a certain low level amount of pests in our lab because we have so many open boxes, but we rotate everything through a freezer so three days in a freezer.

372

01:03:14.880 --> 01:03:28.830

Sam Droege: is enough usually to kill all the eggs and larvae of domestic goods and it keeps our populations low, you can do the same or and or freeze them once and then put them into gigantic zip lock bags.

373

01:03:29.850 --> 01:03:37.860

Sam Droege: You have to be aware, though, that if the specimens really aren't dried out, then you know you could end up with mold in there.

374

01:03:38.640 --> 01:03:49.380

Sam Droege: A general thing is wherever the specimens are should be in an air conditioned space in Ohio well actually anywhere, where you have significant amounts of humidity so I.

375

01:03:50.490 --> 01:04:09.240

Sam Droege: made the mistake myself of having specimens at my house, which is not air conditioned in Maryland in summer and going back after ignoring them for a while and finding just rows and rows of of fuzz where the specimens are but I can't see them anymore.

376

01:04:11.010 --> 01:04:19.800

Sam Droege: So that's a that's a good entrance way into it, you do, ultimately, you know if you're collecting specimens it should be to to give to someone.

377

01:04:21.750 --> 01:04:32.340

Sam Droege: Who can identify them or you pretty much need to get a microscope of some kind to get into the to the detailed ID, so this is not for everybody.

378

01:04:33.030 --> 01:04:42.510

Sam Droege: it's really what i'm talking about is collecting specimens that can be used for identification we do identifications ourselves.

379

01:04:43.380 --> 01:05:00.090

Sam Droege: Usually other people are getting involved just send we don't actually we prefer that people don't pin their own specimens so we prefer that they send us packages of wet specimens that we will then process, because we have our standards, I guess.

380

01:05:01.380 --> 01:05:06.660

Sam Droege: But and the individual basis, you know what I just went through in terms of a net.

381

01:05:07.710 --> 01:05:15.030

Sam Droege: soapy vial canning jar blow dry will get you great specimens, particularly if you processes specimens.

382

01:05:16.050 --> 01:05:19.260

Sam Droege: Within the first 24 hours, let me just say that.

383

01:05:20.280 --> 01:05:29.970

Sam Droege: These will stop moving and soapy water within a minute we actually have time this, but they will also wake back up if they have.

384

01:05:30.870 --> 01:05:36.780

Sam Droege: not been in there for let's say several hours so usually the best thing is to collect them, this will be water.

385

01:05:37.230 --> 01:05:42.420

Sam Droege: process them first thing the next day, if you have time if you don't you drain them and freeze them.

386

01:05:43.200 --> 01:05:53.310

Sam Droege: So if you know we don't bother with alcohol so let's say I have a vial which are centrifuge tubes of specimens in soapy water i'll just.

387

01:05:53.760 --> 01:06:08.220

Sam Droege: Go to the sink and i'll put my fingers as a block and let the water drain out a put in a paper label in pencil and close the lid and throw it into the freezer and then whenever we have time we'll process them.

388

01:06:09.330 --> 01:06:12.930

Denise Ellsworth: Sam i'm just going to jump in because it's a little bit after the hour and and.

389

01:06:13.350 --> 01:06:18.210

Denise Ellsworth: Thank you so much, I mean we're not leaving with Sam, but I want to thank Sam and folks if you have to.

390

01:06:18.510 --> 01:06:30.210

Denise Ellsworth: hop off, I understand that if you want to put a thank you in for Sam in the chat box, I know he'd appreciate that and then we'll turn our attention to some of those questions that you put in the chat box is there a lot of good questions in there.

391

01:06:30.480 --> 01:06:30.990

Sam Droege: I mean there's.

392

01:06:31.140 --> 01:06:37.680

Sam Droege: So many things to cover if you want to get into details and people can visit her lamp to i'll just mention, as an aside.

393

01:06:38.430 --> 01:06:44.850

Denise Ellsworth: There were a couple questions about genetic identification of bees and kind of where we are with that.

394

01:06:46.200 --> 01:06:46.590

Denise Ellsworth: Okay.

395

01:06:46.710 --> 01:07:00.600

Sam Droege: Well, the The short answer is that's a promising field but we're not at the level, in which I can turn over here's a set of frozen bees and we can throw them into some kind of machine and come out with.

396

01:07:01.740 --> 01:07:12.450

Sam Droege: The answers, of what they are and how many that's probably where we will be so we can then collect a lot of specimens and a robot essentially would ID things.

397

01:07:13.020 --> 01:07:29.820

Sam Droege: there's a lot of technical problems, right now, so I would say we're still if if, when we're looking at collecting and determining where species are and how many there are we're still all old school just what I was talking about pin specimens and.

398

01:07:31.230 --> 01:07:33.240

Sam Droege: hand at them under microscope.

399

01:07:34.350 --> 01:07:48.450

Sam Droege: There we use though and send to the to the folks who do these kinds of things specimens all the time, so that they can run their molecular analysis and get a valid you know.

400

01:07:49.500 --> 01:07:58.410

Sam Droege: molecular ID string were or whatever they call it to put into their database, but we're not we're not ready for.

401

01:07:59.730 --> 01:08:03.060

Sam Droege: To do that, as a primary tool.

402

01:08:03.750 --> 01:08:08.160

Denise Ellsworth: Okay Cindy I wonders how much done soap you use in the capture cups.

403

01:08:09.180 --> 01:08:16.620

Sam Droege: Oh, in the chemical just a drop is fine it's pretty concentrated we don't ever measure it when we're doing.

404

01:08:18.660 --> 01:08:24.330

Sam Droege: out in the field we show this, these are our favorite kind of.

405

01:08:25.350 --> 01:08:29.880

Sam Droege: containers for doing water, we have to have these weird labels to them, but.

406

01:08:30.900 --> 01:08:34.530

Sam Droege: They say this is soapy water don't worry but.

407

01:08:36.330 --> 01:08:54.510

Sam Droege: ice, what is it Arizona iced tea some of the orange juice ones you just want to not use milk jugs because they inevitably leak, and this nice handle here, this is great for pouring so doing your bibles that's your archetype of bowl of water holder.

408

01:08:55.950 --> 01:09:02.850

Denise Ellsworth: Are your preservation methods for photography the same as the preservation methods for genetic research.

409

01:09:03.270 --> 01:09:14.520

Sam Droege: i'm pretty much, so we are pulling specimens for our photography from lots of different places, sometimes they're just so rare where you just going to take a picture of it, no matter how ugly it is.

410

01:09:15.570 --> 01:09:26.670

Sam Droege: But a lot of times we're like oh what's the prettiest one of these bees that we collected for that specimen and they'll end up getting their photographs taken.

411

01:09:28.740 --> 01:09:35.460

Sam Droege: I can you know, whenever we want, if we want to at the end i'll walk people over to that photography thing I knew there.

412

01:09:35.490 --> 01:09:37.920

Denise Ellsworth: were questions about that, if you have questions about that.

413

01:09:40.200 --> 01:09:41.400

Denise Ellsworth: um how.

414

01:09:44.070 --> 01:09:48.210

Denise Ellsworth: Mary has a question about volunteers in your lab and you have a lot of volunteers, is that right Sam.

415

01:09:49.500 --> 01:09:58.830

Sam Droege: I would say yeah I mean we take volunteers for a day because of the kind of work we do, we can we'll put anyone to work but yeah.

416

01:09:59.550 --> 01:10:06.390

Sam Droege: i'm glad to i'm glad to have people, we have just lots and lots of things to do, I should also mention that we're basically also.

417

01:10:06.960 --> 01:10:18.690

Sam Droege: In addition to the specimen based things we're also a plant nursery so we're raising a lot of native plants, so that we can plant them here at the B lab we now have 30 acres to play with and.

418

01:10:19.500 --> 01:10:39.480

Sam Droege: We will start doing very more and more intense surveys of individual plant groups, so we really can measure what it is that an individual plant species is supporting in the world which you would think we would know, but we have hints but we really have very little quantitative data.

419

01:10:41.490 --> 01:10:48.240

Denise Ellsworth: Can you describe again why you use and how you use the rhinestones there were a couple people who are a little unsure about that.

420

01:10:48.510 --> 01:10:50.250

Sam Droege: So the rhinestones.

421

01:10:51.810 --> 01:11:04.590

Sam Droege: are good, because they can go through a wash dry cycle without deteriorating they're basically indestructible and so each petri dish we have a whole series of petri dish with unique combinations of rhinestones.

422

01:11:05.790 --> 01:11:18.510

Sam Droege: What can't go through that wash dry cycle is paper right, so if we put the paper and we just get pulp, and so we pull the label out but and then we're running a whole bunch of different.

423

01:11:19.500 --> 01:11:26.970

Sam Droege: batches of specimens but in the end, we have to know like that label goes with that batch so the rhinestones are the connection.

424

01:11:27.390 --> 01:11:44.640

Sam Droege: Between the two and we glue us look at this is based on years of bad experiences so we found that we have to glue the rhinestones to the bottom of a petri dish so that things don't get mixed up gotcha that makes sense.

425

01:11:45.960 --> 01:11:50.940

Denise Ellsworth: There were several people who are enthusiastic about seeing your photos setup So do you want to do that.

426

01:11:51.750 --> 01:11:52.440

Sam Droege: Okay, let me.

427

01:11:53.520 --> 01:11:55.290

Sam Droege: See, I think, wait a minute.

428

01:11:56.310 --> 01:12:03.270

Sam Droege: I just have to I think i'm on the on our network, let me go to wi fi.

429

01:12:04.770 --> 01:12:13.470

Sam Droege: Here, first, I think it will automatically shift we just have this, I want to do that says battery fully charged there we go.

430

01:12:15.150 --> 01:12:17.160

Denise Ellsworth: Oh, and somebody wondering where you are, I mean.

431

01:12:17.490 --> 01:12:28.200

Sam Droege: you're on the on wi fi good smart enough not to connect if we are, we are the production research refuge groups and.

432

01:12:30.570 --> 01:12:43.320

Sam Droege: This is the be lab so repetition research refuge in the old endangered species area, this was a garage the garage door is over there, replace now with our beautiful mosaic.

433

01:12:43.920 --> 01:12:56.730

Sam Droege: Concrete floors and we were sort of do it yourselfers who wants to you should have seen this place before it was just a nightmare in terms of an aesthetic nightmare how about that.

434

01:12:58.020 --> 01:13:04.290

Sam Droege: And so that's productive research refuges between baltimore and.

435

01:13:06.660 --> 01:13:10.950

Sam Droege: Washington right off of the baltimore Washington park way.

436

01:13:12.000 --> 01:13:24.030

Sam Droege: If that makes sense it's big green spot it's lovely to work here so i'm closing off the curtains and I want to make sure that we're not blinded so here's here's our setup.

437

01:13:24.570 --> 01:13:42.060

Sam Droege: So what you're looking at here is a camera, this is just an off the shelf canon mark three, which is way out of date, but we don't need a lot of the features of that camera we basically just need a large sensor area on there.

438

01:13:42.930 --> 01:14:02.220

Sam Droege: there's a repurpose jack stand here, which is used in chemistry just allows us to raise and lower this there's a block of

plasticine clay covered in black velvet black velvet much blacker than black felt as another little tip.

439

01:14:03.240 --> 01:14:06.840

Sam Droege: And the specimen would go on here either.

440

01:14:07.860 --> 01:14:16.470

Sam Droege: To show the back or up right and the camera is on a sled let's see if I can get a little closer here.

441

01:14:19.230 --> 01:14:33.630

Sam Droege: You can hear the freezer in loud way there so, hopefully, you can hear it, so the sled is here, we have, because the Flash uses we're asking the Flash a lot of the Flash we have a power.

442

01:14:35.100 --> 01:14:50.220

Sam Droege: unit I think it's the only one made that's the quantum one that will run off electricity, so you can buy battery you know big batteries for that, too, but this run straight off of juice and that will run the Flash.

443

01:14:51.870 --> 01:15:08.940

Sam Droege: there's a microprocessor here, which is not on that allows us to program the slit the sled will basically say start here, and here, take a picture every so many microns it runs through that and then.

444

01:15:09.570 --> 01:15:20.340

Sam Droege: We take that collection of shots and run it through a software package over here, you can see some of the pictures that were in process of there now.

445

01:15:21.360 --> 01:15:24.930

Sam Droege: And it takes all those sorry for the news and freezer.

446

01:15:25.950 --> 01:15:30.120

Sam Droege: takes all those pictures and recombine them into one.

447

01:15:32.220 --> 01:15:50.790

Sam Droege: Completely in focus so it's about focus on the lenses that we use, so this is a canon 65 millimeter one to five X, so it can go

to five times the magnification of a normal subject and that's great except for the.

448

01:15:53.130 --> 01:16:00.930

Sam Droege: The amount of so in practical terms like a couple of antennas segments are in focus when you take one picture.

449

01:16:01.350 --> 01:16:13.380

Sam Droege: So it's not useful as a single shot thing, but if you take a whole series, then you can combine them and that's what we're doing and then there's a lot of photoshop futzing around we have.

450

01:16:14.010 --> 01:16:23.580

Sam Droege: Some links and things for people if they want more information, this is not complete unless the beer cooler is on top of everything.

451

01:16:24.690 --> 01:16:34.890

Sam Droege: To add reflective surface surface so there's a black velvet backdrop, we want black in the backgrounds.

452

01:16:36.120 --> 01:16:49.740

Sam Droege: me just too many things going on here, we would set this up different or inaction, but just to show you we play around with different what we call bridges over the specimens that are.

453

01:16:51.300 --> 01:17:05.910

Sam Droege: Where we'll do different kinds of D lemon reflective surfaces and then ultimately we drop not going to do this well we dropped the box over the top, and the Flash is bouncing around in the beer cooler.

454

01:17:07.230 --> 01:17:10.320

Sam Droege: And wow i'm not very good at this in my and.

455

01:17:11.400 --> 01:17:15.600

Sam Droege: we'll put a black in it even further will drop a.

456

01:17:17.040 --> 01:17:32.880

Sam Droege: They build it squat over everything, and then we can hit the start of the microprocessor and it will run through and take

whatever number of pictures meet our criteria.

457

01:17:34.110 --> 01:17:36.900

Denise Ellsworth: And there's a question why black instead of white background.

458

01:17:37.470 --> 01:17:47.040

Sam Droege: um it's a preference thing, but it has practical i'm going to move away from the noise there, it has practical outcome because.

459

01:17:48.840 --> 01:17:50.100

Sam Droege: The that's bad shot.

460

01:17:53.640 --> 01:17:54.570

Sam Droege: With white.

461

01:17:57.060 --> 01:18:07.890

Sam Droege: You know, late fall off as exponential function, and so the what inevitably when you're using white you're not getting pure white you're getting a whole series of whites to graze.

462

01:18:08.280 --> 01:18:24.360

Sam Droege: Even though it looks very white and it's very difficult to modify the background, then with black through some basic tricks, we can push it to absolute black so most of our shots are going to be 000 on the.

463

01:18:25.200 --> 01:18:48.180

Sam Droege: color pixel chart sometimes we get that from you know being good at our setup and the cameras happy about it, but a lot of times you know we just do that in photoshop and then we can place that specimen in any kind of black space that we want without having to come up with some connived.

464

01:18:49.320 --> 01:18:55.980

Sam Droege: Border shading photoshop thing that would be horrible so that's why okay.

465

01:18:56.370 --> 01:18:59.070

Denise Ellsworth: uh Bob asked if that is a stack shot.

466

01:19:00.300 --> 01:19:06.900

Sam Droege: yeah yeah I don't know that there's other so there's a forum called.

467

01:19:08.190 --> 01:19:19.650

Sam Droege: Macro photography.net where like everyone who is deep into this puts posts and it's like basically nerdy white guys and.

468

01:19:20.760 --> 01:19:25.110

Sam Droege: You know they're machining their own equipment there's lots of different ways to do it, but.

469

01:19:26.190 --> 01:19:32.970

Sam Droege: For off the shelf kinds of things I think stack shot is about the only game in town, I could be wrong out.

470

01:19:33.840 --> 01:19:44.910

Denise Ellsworth: There right if people who would like to give your lab money, and so they would like to know how to do that is the discover life of bliss these link that Elizabeth put in, is that the.

471

01:19:45.330 --> 01:19:46.980

Sam Droege: yeah plus the Foundation.

472

01:19:47.550 --> 01:19:50.550

Sam Droege: Is where money can be doing and that's great because.

473

01:19:51.390 --> 01:20:02.940

Sam Droege: I am the actually the only employee here by the Federal Government, other than Claire my fees works for fish and wildlife service who just joined us, but our technicians or our lab manager.

474

01:20:04.050 --> 01:20:09.780

Sam Droege: is paid by you know soft money or out of my pocket so that would be awesome.

475

01:20:10.470 --> 01:20:18.900

Sam Droege: And i'll just say expansion wise we're we're expanding to lots of outside plant things we have a good volunteer network of just the plant people.

476

01:20:19.680 --> 01:20:41.220

Sam Droege: And there is talk of a national pollinator Center getting placed here on the refuge as possible, you know many you know multiple year new kind of initiative by the Biden administration we'll see how that goes but oh my gosh so much more interest Now then, in the last four years about.

477

01:20:43.380 --> 01:20:45.120

Sam Droege: Bees um so it's good.

478

01:20:46.380 --> 01:20:47.070

Sam Droege: Little eileen.

479

01:20:49.290 --> 01:21:00.510

Denise Ellsworth: eileen had a question about your work on powerline corridors and she wonders if you have any updates on how us energy companies are moving along with that, particularly with the monarch habitat.

480

01:21:00.810 --> 01:21:07.800

Sam Droege: yeah so i'm a monarch habitat, I think, is probably actually more of a game, then then because it's.

481

01:21:09.150 --> 01:21:16.680

Sam Droege: it's just got more let's call it public cache you know it's something that people get like right off the BAT oh yeah of course monarchs.

482

01:21:17.190 --> 01:21:21.660

Sam Droege: Whereas native bees, people are ramping up to that, but they also don't have a lot of.

483

01:21:22.200 --> 01:21:29.610

Sam Droege: Like inherent understanding of how that works, so a lot of the monarch thing indirectly is going to benefit most of our plant work.

484

01:21:30.450 --> 01:21:40.620

Sam Droege: But what will want from power companies and here at the refuge, we see a lot of rare and uncommon beans on managed power lines

that don't just herbicide everything out.

485

01:21:41.310 --> 01:21:58.530

Sam Droege: So the The point is that these powerline corridors are super important as scrubby habitat that in a matrix of either forester or agricultural, industrial man made things and so.

486

01:21:59.700 --> 01:22:09.000

Sam Droege: We have, if you go if you do Jared Fowler and druggie you'll find it it's basically Jared fellers work to ours and Jared.

487

01:22:09.600 --> 01:22:24.150

Sam Droege: And there's a list of specialist bees So these are the kinds of plants we're looking at more intensely to act as you know, so that the biodiversity of these is supported by the biodiversity of plants.

488

01:22:26.160 --> 01:22:28.200

Denise Ellsworth: trying to get that link real quick to put in the.

489

01:22:28.290 --> 01:22:33.510

Sam Droege: In the yeah it's done for the whole Jared has done it for the whole country now so all of North America.

490

01:22:34.230 --> 01:22:45.780

Sam Droege: All of us has at least a start of a list of bees that are super specialized, and by that I mean like willow has eight species in Maryland that of bs at only go to Willem.

491

01:22:46.470 --> 01:22:51.900

Sam Droege: Now it might go to several different willows pieces, but if you don't have willow you don't have those bees are gone.

492

01:22:52.260 --> 01:23:03.900

Sam Droege: We can look at cacti and we can look at prickly pear daughter, of all things, has at least one species of be That only goes to daughter so more and more, we see biodiversity as a general.

493

01:23:05.820 --> 01:23:13.770

Sam Droege: strategy for conservation as being important for bees to it's not just plant clover and job well done.

494

01:23:15.780 --> 01:23:20.130

Denise Ellsworth: Sorry somehow I got the wrong link for this specialist bees, give me just a SEC here.

495

01:23:22.290 --> 01:23:26.790

Denise Ellsworth: So, Sam what I wanted to okay monitoring.

496

01:23:28.200 --> 01:23:29.370

Denise Ellsworth: Sorry guys my my.

497

01:23:30.630 --> 01:23:37.260

Denise Ellsworth: copy and paste is not working, maybe somebody else can put that specialist be listed in there, I keep getting your flickr page it's.

498

01:23:38.610 --> 01:23:39.030

Denise Ellsworth: Over.

499

01:23:39.150 --> 01:23:44.010

Sam Droege: yeah if you do Fowler and druggie you know drug is just an uncommon name so.

500

01:23:44.070 --> 01:23:44.700

Here we go clear.

501

01:23:45.750 --> 01:23:46.200

Sam Droege: There we go.

502

01:23:48.240 --> 01:23:52.860

Denise Ellsworth: source with the bees and then there's a source with the plants, I use them all the time it really great.

503

01:23:53.160 --> 01:24:04.830

Sam Droege: And I This is where we're going will be providing more and more detailed list of like the value of different kinds of plants in terms of NBC support it's a year's effort this you know.

504

01:24:05.130 --> 01:24:15.570

Sam Droege: there's a reason that these lists this this detailed information doesn't exist because it's time consuming you want to replicated in a bunch of places that.

505

01:24:16.620 --> 01:24:20.100

Sam Droege: We will have a Bumblebee survey floral survey that.

506

01:24:21.570 --> 01:24:31.650

Sam Droege: Keep that for people to look at we've developed a technique now I think Denise you're may be aware of this already and next year will be releasing that to.

507

01:24:32.310 --> 01:24:39.570

Sam Droege: general use and have a little program, at least for the Northeast for looking at how bumblebees divide up the world because.

508

01:24:40.380 --> 01:24:50.100

Sam Droege: Even understanding that that's a Bumblebee and that's a carpenter be but I don't know which Bumblebee is going to give us some pretty important information and it's the kind of thing that can be done.

509

01:24:50.640 --> 01:25:03.870

Sam Droege: anywhere and we like guard your garden is one of the better places, you have a set of plants bumblebees make choices what's their choice, today, you know little half hour walk around the garden is really all we're talking.

510

01:25:04.740 --> 01:25:10.560

Denise Ellsworth: And Sam i'm going to pull you back in then next year because we're going to do a monthly bombus be course I Bumblebee.

511

01:25:10.560 --> 01:25:10.980

Sam Droege: coast.

512

01:25:11.040 --> 01:25:12.270

Denise Ellsworth: yeah definitely yeah.

513

01:25:13.140 --> 01:25:19.980

Sam Droege: I I prefer, if possible, just to get people throughout the year as the you know do that earlier rather than later.

514

01:25:20.850 --> 01:25:30.330

Denise Ellsworth: Great so i'm going to end our session Sam I want to thank you so much for taking us around the lab all the information that you shared not just this morning, but in all that you do really.

515

01:25:30.810 --> 01:25:45.870

Denise Ellsworth: A great example of how science can you know produce things that can be really used by a lot of different people i'm going to share this screen, so this is the screen some of where you were asking about the site where you can make a donation if you'd like.

516

01:25:47.100 --> 01:25:52.380

Denise Ellsworth: And I wanted to make sure this was in the recording since the chat isn't easily accessible in the recording so.

517

01:25:52.440 --> 01:25:53.700

Sam Droege: yeah that's great.

518

01:25:54.870 --> 01:25:55.290

Denise Ellsworth: and

519

01:25:55.410 --> 01:25:57.300

Sam Droege: extra bonus for giving this talk.

520

01:25:57.720 --> 01:26:03.990

Denise Ellsworth: Great so thanks again Sam everybody thanks for for coming and we'll see you next week next month.

521

01:26:04.590 --> 01:26:06.090

Sam Droege: Okay, thanks Denise.

522

01:26:06.480 --> 01:26:06.720

Denise Ellsworth: I.

523

01:26:06.750 --> 01:26:07.980

Thanks everybody everyone.

524

01:26:12.810 --> 01:26:14.430

Marcia Carsten: nisha need to stop the recording.

525

01:26:15.060 --> 01:26:15.360

So.

526

01:26:16.500 --> 01:26:17.490

Sam Droege: I have to stop it, I think.

527

01:26:17.520 --> 01:26:19.230

Sam Droege: Okay, good Thank you see.

528

01:26:19.830 --> 01:26:20.730

Somebody do it.

529

01:26:23.940 --> 01:26:25.170

Sam Droege: All right, i'm pressing.

530

01:26:26.370 --> 01:26:28.680

Sam Droege: and pressing stop recording it think.

531

01:26:30.600 --> 01:26:30.870

Sam Droege: Oh.

532

01:26:33.180 --> 01:26:35.940

Sam Droege: Am I stopping it and starting it it doesn't.

533

01:26:38.280 --> 01:26:39.390

Sam Droege: Am I doing wrong here.

534

01:26:40.470 --> 01:26:42.420

Denise Ellsworth: OK, I see the park, I can see it now.

535

01:26:42.450 --> 01:26:44.310

Denise Ellsworth: Now I got it stop recording there.

536

01:26:44.700 --> 01:26:45.090

Okay.

