**Introduction to AIM Pollinator Supplemental Indicators Webinar**

**[Lori Young]:** Hello and welcome everybody to this webinar explaining how to use the AIM Pollinator Supplemental Indicators. My name is Lori Young and I am the Wildlife and Plant Conservation Training Coordinator at the BLM National Training Center in Phoenix

I will now introduce our speakers. Our speakers today are Casey Burns, AK State Wildlife and Threatened &Endangered species Program Lead; Jessa Davis, an Ecologist and Botanist in the Owyhee Field Office in Idaho, and Nathan Redecker is the Botany and Monitoring Specialist in the NM State Office. They have worked very hard over the last few years in creating, piloting, and testing this data sheet to make it easy for you to use.

And with that, I will turn it over to Casey.

**[00:46] Casey Burns:** Thanks, Lori. I 'm going to pass it to Robert as  our local host for a for a quick welcome from him.

**[00:54] Robert Pattison:** Great. Thanks, Casey and everybody. When this all started, at least in Oregon and Washington, I'm the Oregon-Washington AIM Coordinator and various districts had heard about the pollinator protocol, and they just wanted to implement it because they found a need to have those data come in from AIM plots. So this year, in 2020, assuming we can have a field season, we are going to be implementing the protocol on two districts for about a total of 125 plots. And in order to do that we’re going to have an on-line training and Casey, and Jessa, and Nathan agreed to go ahead and put this together for us, so thanks alot.

**[01:38] Casey Burns:** All right. Thanks, Robert, and thank you guys all for attending. This is the first time we’ve done this on-line version of the training for this. So as Lori mentioned, we are recording this and it will be used for you guys to reference it again in the future if you’re interested but also potentially for other AIM crews that are out there around BLM land that will be implementing this this year, and potentially for future years as well. So thank you for being a part of this and feel free as we go through here to ask any questions either verbally or in the chat box. I’ve got the chat box open so I’ll keep an eye on it, and Lori, maybe if you see something pop up in the chat box that I missed, could you, could you let me know, too?

**[02:23 ] Lori:** Of course.

**[02:25] Casey:** All right. Thanks. So you can see our agenda here on this slide. We’ve got the, pretty much, the introduction and then the data sheet and the instruction sheet broken down into sections that we’ll go through with you all. And then we’ll wrap it up with some discussion on kind of some of the data collection and compellation efficiencies that are worked into this this year, actually as new feature. And we’ll leave plenty of time at the end hopefully for any other questions you might have.

**[02:56]** So, I will jump into the presentation now. So, as you guys know, we’ve got a diverse native bee fauna in the United States. People probably don’t realize how diverse we have of our species richness in the country, though.

**[03:13]** We have over 3500 species described bee species, 18 percent of the world’s known species, and again, only on 7.3 percent of the land mass. So we do have some exceptional diversity in our country, partially due to the habitat diversity that we have.

**[03:30]** I think also partially due to we have a better studied bee fauna than many other places in the world, even though we’re still discovering new species regularly within the U.S.

**[03:42]** And in the past decade, especially in the last few years, there’s been an increasing level of attention for the conservation and management of bees and their habitat.

**[03:54]** And BLM is an active participant in habitat management and considerations for bees and part of that is inventory and understanding what we have that leads us to the APSI protocol that we’ll be talking about today.

**[04:13 Bee Species Richness Slide]** So just a map here on the bee species richness by ecoregion. The hotter colors are the higher richness ecoregions. And in the west, especially the southwest, you can see the hottest hot spots for bee species richness.

**[04:34]** And for you all in Oregon, especially in eastern Oregon, you’re in some moderately hot spots as well.

**[04:46 Richness and BLM Lands Slide]** But what I want to share here is this map compared to the next map of where we have BLM land off to the right side.

**[04:50]** And you can see a lot of those hot spots in the kind of intermountain west and especially the arid southwest are areas where we have high concentrations of BLM land.

**[05:00]** So again, BLM is an important player in the habitat management of bees across the west and especially in some areas in the southwest.

**[05:14 BLM Mission Slide]** And how does this all fit in to what BLM does? I just shared the BLM mission here which you might be familiar with but it’s always worth reminding people that the BLM mission is “To sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.”

**[05:33]** So when you break that apart a little bit, you know, you see the word diversity in there, you know, how do you know what the diversity is on the public lands?

**[05:42]** Well, it leads us to ask questions about inventory and monitoring. So, the second bullet get into our requirement of .. to do inventory and monitoring on BLM-managed lands on a continuing basis

**[05:59]** and the inventory to be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values. So I highlighted some of the bold . . .

**[06:11]** I bolded some of the important words there on . . . that kind of pertain to why we’re doing this. We need to have an inventory of what we have out there and keep that inventory current so that leads to monitoring

**[06:23]** to detect and reflect the changes that are happening on our land and identify kind of resources and values. And I think these would fit into that well as an emerging resource and value that people are starting to put a lot more recognition on for their value to ecosystem function and their economic value to agriculture and other human uses.

**[06:51 History Slide]** So, the APSI Introduction. So, as good government employees, we took one acronym, AIM, and took the first letter of that acronym and rolled it into another acronym and turned that into APSI.

**[07:03]** SoI’ll be referring to AIM Pollinator Supplementary Indicator as APSI as we move into this presentation.

**[07:09]**  And just a little bit of history here, this has been primarily spurred by the commitments that came out of the National strategy that came out in 2015 which led to BLM commitments as part of the BLM policy that was issued in 2016.

**[07:27]** And I just included on the right some of the specific commitments that APSI will help us live up to, so that is what led us to do this.

**[07:32]** We saw this opportunity, while we’re out there doing AIM, we’ve probably put in 95 percent of the work already that we need to figure this out.

**[07:47]** You know, we’ve done the landscape stratification that you need to do with AIM to identify your plots, we’ve hired you guys for these crews, trained people up.

**[07:56]**  You get in the vehicles, you get out in the field, you set up your AIM plots, you know, you do all your vegetation measurements.

**[08:03]** It’s a ton of work, a big commitment, you know, a fair amount of cost to doing all that. And then with a few more small additions to that we can get a lot of valuable information to build on what we’ve collected from AIM to inform us on the value of some of these areas for bees, in terms of their habitat and some of the actual uses of bees of these areas as well as.

**[08:30]** So we’re entering our 5th season now. This is the kick off, we’ve got four field seasons under our belt, using APSI. And we’ve kind of reevaluated it and improved it every year.

**[08:42]** We’ve taken feedback from the folks in the field that have done that and we welcome that again from you guys after this field season.

**[08:48]** And we always try to continually improve it and make it better; but also part of that challenge is to keep it backwards compatible, so we’re collecting data in a dataset that can still be kind of rolled up over all the years of APSI.

**[09:02]** So we’ve succeeded in that so far and we hope that we will not be making major changes moving forward, but it seems like we do learn something every year that try to tweak this and make it a little bit better.

**[09:16]** So far, APSI’s been used in six states and there’s interest in other states to use APSI as well. You can see the states there, including Oregon

**[09:26]** So, we’ll be implementing that in most of these states again this year and hopefully more as time goes on.

**[09:34 APSI Uses Slide]** So APSI can be used for a lot of different things, and that’s one of the things I really like about it is is you can, you can use this fairly simple protocol, that doesn’t take long, and really in kind of the spirit of AIM, get multiple uses out of this, out of this data.

**[09:53]** You can create pollinator-friendly plant lists with bloom periods for the, for the flowers, by ecological site or other unit out there, either ecological unit, like an MLRA or some administrative unit, like a field office boundary or any other kind of geographical boundary you’d like to draw.

**[10:14]** And there’s a lot of requests out there for pollinator-friendly plant lists. We don’t have a lot of kind of site-specific information, especially for some of the more rural places around the west.

**[10:26]** We can also use APSI for targeted pollinator and pollinator habitat site assessments so to understand what’s going on in a specific site, we can use this.

**[10:37]** You can also use it for the time periods you are lacking floral resources especially in some of the more arid part of west. When things get hotter and drier you lose floral resources and sometimes later in the season you lose floral resources

**[10:55]** There’s some general, kind of thoughts about that and kind of information but not a lot site specific information. And not having floral resources means, often means stress on your bee populations so kind of identifying these times where we’re lacking the floral resources and using that to hopefully treat the land appropriately to regain the native plants and during those time periods.

**[11:21]** You can use APSI to asses the impacts of a project on pollinators, kind of doing this before, during, and after over time on a site or a series of sites in an area to track changes over time,

**[11:34]** You can use this to develop seed mixes by identifying what plants are flowering in what area and when they’re seeding to identify the collection of . . . timing of your seed as well for areas for specific species to get that real local information of when the right time to collect these seeds are.

**[11:55]** And also kind of detection over time of phenological shifts. So seeing bloom periods changing over time, things blooming earlier and things like that. So there’s a lot of different uses that you can potentially use this for

**[12:08]** And it’s really up to the local folks that are implementing this on which or how many of these different uses they want to apply the data to after they collect it. But I do think it’s important for you all to understand kind of where this information’s going after you collect it in the field.

**[12:23]** So APSI is intended to identify valuable pollinator plant species and habitat by building upon the AIM plots and the AIM methodology.

**[12:35]** And the goal is to assess the phenological phases of the floral resources in the plot and then conduct kind of basic presence/absence or short tallies of pollinators by major pollinator group and then, tallies associated with the plant species.

**[12:53]** And we’ll get into that later as we get into the details here

**[12:57]** This can be used in conjunction with the core AIM methods which I believe is primarily what you’ll be doing in Oregon. It can also be used to supplement stratified landscape level AIM surveys in certain areas

**[13:10]** or it can be used as a targeted assessment on an individual site independent from AIM or just in conjunction with line-point intercept specifically and not with all of AIM. And I’ve used it like that in Alaska as well.

**[13:25]** We also applied this protocol to the AIM process and it only requires minimal amount of additional time. So we’re looking at 15-30 minutes maximum per plot

**[13:35]** We’ve kind of held ourselves to that over the years as we worked through this because we don’t want to go beyond asking for 30 additional minutes because we think that would minimize the amount of use it would get if we were asking for too much more time per plot.

**[13:49]** And again, also minimal training. You guys are gonna get this hour of training today. And we’re hoping we have some interested folks out there that have got some good botany skills and you know, that’s kind of all we’re looking for is that baseline level of knowledge and interest from you all.

**[14:06 Section A Slide]** So getting into the form now, and you can follow along on your data sheet and your instructions if you’d like as we go through this but also if you want to kinf of reference some things for questions as you go. Please keep those handy.

**[14:23]** This is Section A of the form which is basic site information. It isn’t too complex so I’ll cover this quickly. I’m not gonna cover all the details in here because some of them are obvious

**[14:34]** But the AIM plot ID is something you’ll have handy for each AIM plot that you’re on so that shouldn’t be too hard to come by.

**[14:42]** And I’ll hit a few things here that might not be as familiar to you all. So we’re recording the sky as a number from zero to ten based on the percent cloud cover in ten percent increments.

**[14:56]** So a one would be ten percent cloud cover up to a ten that would equal 100 percent cloud cover. It’s just to get a general idea of what the cloud cover is at the time of your survey.

**[15:07]** And then the Beaufort Wind Force, I put the graphic off to the right there. You can see some of the different numbers and descriptions of what that looks like, or terminology associated with that a zero is calm, six is a strong breeze

**[15:21]**, It’s got the miles per hour and some visuals of what trees look like, though I know sometimes you guys won’t be around trees. But this is just to give us a general idea of how windy it is out there.

**[15:34]** You know if you’re not sure if it’s a four or a five or if it’s a one or a two, it’s not a huge deal, just get as close as you can. And really the main point is, we want to know if it’s really windy out there.

**[15:45]** You know once you’re getting to a four or a five its gonna start really impacting your ability to spot bees flying around on site because they’ll be hunkering down more.

**[15:57]** So, just capturing the wind force there. The temperature measurement is an estimate within five degrees. A vehicle thermometer can be used. We’re not looking for down to the specific degree but just a general estimate to what the temperature is

**[16:14]** Again, looking at if it’s potentially too, on the cooler end, you know when you start getting below 60, 55, down to 50 especially, you’re gonna have limitations in what’s going to be flying,

**[16:28]** especially the smaller bees will get cold and sit down when it’s too cool. And on the other end of the spectrum, if it’s very, very hot, that may also limit the movement of the bees and limit your observations.

**[16:38]** And the last thing I’ll mention is the BLM office code down in the bottom right. You guys, it sounds like you’ll be working out of two BLM Field Offices so I think you’ll get familiar with those very quickly.

**[16:48]** But if you look on the Excel tab, the farthest right tab has all of the BLM office codes for the entirety of BLM and you’ll be able to find any BLM office that you need on there.

**[17:00]** The last thing I’ll mention is the optional data sheet. You can see in the bottom left corner of the graphic, it says optional data sheet, circle one, yes or no. That’ll be the optional sections D through I, which I’ll cover later.

**[17:13]** So we just want to know if that’s been done to make sure it stays attached to this. Often if will not be done. We don’t always expect to see it there, but if it is, we just want to make sure that that data sheet stays associated with the other parts of this form. That’s why that’s there

**[17:30 Section B Slide]** And now I want to move on to Section B and pass it to Jessa.

**[17:37 Jessa Davis]** Ok. So this is pretty straightforward. So Section B focuses on insect pollinated plant species. So basically, you’re going to pull those plant species from, ideally your species richness forms, since everybody’s doing that.

**[17:52]** with the top ten most abundant species on the plot. And ten is the minimum number, you can do more than 10. The data sheet has room for up to 15. Otherwise you’ll need to have an additional data sheet available for that.

**[18:11]** And to do more than ten is up to your project lead or your point of contact and what types of data that they are interested in

**[18:11]** You’ll collect the top ten species and exclude grasses, sagebrush, and conifers. Basically, you want showy, flowery things, right? which includes chenopods because, you know, *Atriplex* saltbush species, because we’ve had questions about that.

**[18:21]** They aren’t necessarily the most charismaticspecies for pollinators, but there’s actually a lot of butterflies and moths which will visit certain saltbush species.

**[18:48]** And then you collect the pheno-phases, so you have a few options. So you have dormant, a vegetative state, a bud phase, flower, seed, post-seed, and dead.

**[19:02]** I’m not going to go and read through all of them but at the end of that they all of the pheno phases added together need to add up to 100 percent. So if your math is a little off make sure you go back and look at it.

**[19:21 Casey Burns]** Hey Jessa, What about invasive species or weeds on site? Could you mention that?

**[19:26 Jessa Davis]** Oh yeah, all of those count. It’s the same as your species richness. So whatever is recorded in species richness, and do it by overall abundance, it doesn’t matter if it’s a native species or not.

**[19:44]** SoI guess, and in the high desert where you guys will be working, you’ll have a lot of little non-native things such as, say, *Alyssum desertorum*, that counts. Or thistles, thistles will count, non-native thistles, I should say.

**[19:56]** And weedy stuff, I know that alfalfa is a popular species put in post fire seed mixes, so that would count as well, just as an example.

**[20:10 CB]** Jessa, could you talk a little bit about the plot cover percentage and how you figure that out?

**[20:18 JD]** Yeah

**[20:19 speaker]** Hi Jessa, so actually I have a question. So rabbitbrush would be included but sagebrush is not? Is there a reason for that?

**[20:31]** Yeah, it has more to do with the likelihood of insect visitation. Rabbitbrush, especially in the fall is going to be your primary nectar source for a lot of different things, mostly because it may be the only thing flowering or it might be the only thing available, in the high desert especially, come August, September, but sagebrush isn’t near as attractive

**[20:55]**. So then the plot cover percent is that last column, and that’s an ocular estimate of the total cover of each individual species on the plot. So remember that your plots are about an acre, there like three quarters of an acre

**[21:15]** So you look at the relative canopy cover of your given plant species throughout the plot.

**[21:23]** And the example in the instructions, which is on page 2 of the instructions, is for example, *Phlox hoodii*, covers approximately a ten by ten meter area of a one acre plot, so that’s about 2.5 percent of your total plot cover.

**[21:43]** This column obviously does not need to add up to 100 and use a known area. If anybody’s done Seeds of Success, you know you can use different ways to measure cover when you’re estimating your population.

**[21:59]** So, some people, like if you’re doing production on a site you can use a hoop, or they figure out how big their backpack is, or they measure a badger hole, or some badger disturbance in the plot and figure out how big that is and use that as a relative metric to estimate cover for a species.

**[22:20 attendee]** I have a question about the phenological phases data. Let’s say there are six individuals of a species that you observe. An individual can be in different phases, so there are buds on the plant and half of them are open, so you’d say 50 percent are in bud and 50 percent are in flower? Or would you also have to account for the amount that’s vegetative? Or is it the number [inaudible], make sense?

**[22:52 JD]** Kinda . . I think you might be conflating a couple of things. So vegetative means would mean that there’s no, it’s not budding, right? so it’s not actively putting out flowers

**[23:09]** In, the **. . .**and it’s on the slide too. Vegetative is green growth but no evidence of buds, flowers, seeds, or post seed.

**[23:15]** But then budding, you’re seeing stalks coming up with closed flowers. And then flowering is the flower is open and available. So you’ll have to weigh that on an individual basis.

**[23:27]** So if I have a population of like six, we’ll just say *Erigeron* species, and three of them are in the bud stage and three of them are in flower, then yeah, we’d say 50 percent bud and 50 percent flower.

**[23:44 attendee]** Ok. Thank you.

**[23:46 JD]** Was that clear?

**[24:48 attendee]** Yes, it was

**[23:50 JD]** Ok. Yeah, just refer back to the phenophases descriptions in the instructions too, those are helpful.

**[24:02]** And I think the [inaudible] for Section B, summarize the phenology, plot cover. If one plant has flowers and buds, which do we pick?

**[24:19]** I don’t believe we intended this to be on an individual plant basis, if I recall. And someone correct me . ..

**[24:27 attendee] . . .** that’s why I was confused because it says at the bottom an individual plant can have multiple phenophases

**[24:34 CB]** Yeah I’d rec . . . this is Casey. I’d recommend kind of interpolating then. It, you know, if you have a shrub that’s kind of half floweringandr half seeding, or half budding and half flowering, then you can split that 50:50 for that individual plant and then whatever else, you know is going on in the plot, you can, you can kind of make that inference if you think it’s kind of part of one and part of another.

**[25:01]** This is a hard one to calculate . . . real specific numbers. We’re just trying to get an idea, usually down to around five percent. We don’t expect you to get down to one percent on this usually, but down to about five percent to what the general phases are on site so we can kind of track this over time as these plants kind of develop and understand the phenology of when the flower is available as a floral resource and also potentially when seeds are available for collection.

**[25:31 JD]** So think of them as a population not as an individual. Think of them as an entity. Think of them as a species. So what is going on as a species? Does that make more sense?

**[25:45 attendee]** Yes it does.

**[25:48 JD]** Ok

**[25:49 CB]** That’s a good way, Jessa, thanks.

**[25:54 JD]** Okay, so I think I’m passing it to . . . is it back to you or is it back to Nathan?

**[26:01 CB]** Nathan’s up.

**[26:04 Nathan Redecker Section C1 Slide]** All right.Thank you, Jessa. So, in the next section, next couple of sections, subsection, Section C, you’re gonna start looking at the actual pollinators on site.

**[26:15]** So in this first section you’re going to make note of any additional methods that are being done on the plot whether while you’re there,if you’re throwing out some pan traps for an entomologist that’s going to assess that collection later or if you have some folks coming in later and doing a netting study or any other kind of photo analysis.

**[26:37]** If you guys are taking intensive photos of pollinators or any other kind of assessment or collection or various protocols that might be going on in your project area, whether your project lead has told you about it or that your state lead has indicated that this might be happening in the area must make sure that you’re noting that and then who’s doing it and maybe when they’re doing it in association when you did this collection.

**[27:04]** Just so that that data can be aggregated or related back to this data set and that we’re not missing some of those pollinator data sets or those pollinator data that is associated with this site location.

**[27:15]** So this section 1, sometimes they’ll be filled in if you know of additional assessments that are going to be happening on plot. But most times it’s just going to be kind of, if you guys are taking a lot of photos you might indicate that you took a whole bunch of photos and then give them to Xerxes Society or a local entomologist or some other local expert that might help you with identification later on down the road.

**[27:43]** So that’s what this section is [inaudible] for, just to give you a note or section to note that for this APSI protocol.

**[27:54 Slide C2]** And then in Section C2, this is where you’re going to try, to the best of your ability, group all the pollinators that you see on actively flowering plants.

**[28:08]** So you’re going to disregard anything that’s not in flower unless it’s been indicated by your project lead, state lead that you need to look at chenopods or if you need to look at some of these other host plants

**[28:18]** So if you need to look at milkweeds for monarch larva, or you need to look for eggs on milkweed, or something like that.

**[28:25]** If there’s specific host plants that you are made aware of, you want to note those plants. And if you see pollinators or larval plants on there, whether it’s in the notes or in this section

**[28:39]** But most of the time for C2 you’re going to focus on your flowering individuals. So every species that’s flowering, those are the ones that you’re gonna focus on.

**[28:48]** And you’re going to try to quantify, to the best of your ability, how many of these groups you observed for each of these species.

**[29:00]** Now we know this is a task for sure, and this is a count, So that’s why we made these boxes, rel .. bigger than they used to be.

**[29:09]** So you can just basically survey your whole area like you would for species richness and kind of look at all of your flowering individuals and try to note how many native bees, small bees vs. big bees and if you see honey bees and try to just categorize them as best as you can.

**[29:28]** We’re not looking for exact, I guess, exact numbers here, we’re just trying to get an estimate of how many, what kind of quantity of bees, or what kind of quantity of pollinators you have on site.

**[29:40]** If there’s hundreds of pollinators just zooming around this acre or so of an AIM plot, we just want . . ., maybe you get one of those counters in hand and you’re just counting as many as you see. Try to get that number for each flowering species out there.

**[29:58]** So this is just to the best of your ability and then as you come across if you can identify any of those species, you can take notes on specific species, for specific genuses, or I guess, specific genera that you might note for specific plant species.

**[30:16]** And then also in this section you’re going to note when you start this observation period and when you end this observation period. This period should be approximately 15 minutes and just going back to what Casey said, we’re trying to make this as consolidated of a method as possible.

**[30:33]** So we’re not trying to put another half hour, another hour on your time at plot. We’re just trying to get a quick snapshot of what you see on plot in terms of pollinator abundance, really, is what this section is going for.

**[30:46]** I just want to hit home that you’re only going for the actively flowering species unless noted otherwise by your project lead or your state lead or your state pollinator coordinator

**[30:56]** And then also one other note, if you do see if you see pollinators that aren’t associated with a flower and they’re just flying through, I guess hummingbirds do this a lot, they’ll just buzz through your plot, and you can make that observation.

**[31:07]** Or you can get bumblebees just patrolling not associated with anything, or you can get certain other solitary bees patrolling a certain patch of flowering species; they’re not on flowers, per se, but they’re associated with that plot so you can tally those in the plot row which is at the bottom of this section of C2 before the next section.

**[31:27]** But those are some other notify . . . areas where you can note specific species that are unassociated with species or unassociated with the plant per se.

**[31:39 CB]** Nathan, it’s Casey, sorry, let me add one thing in too. If you see a bumblebee, it’s obviously going to be, for the most part, a native bee, but you don’t need to double count.

**[31:51]** So that native bee is all other bees that aren’t bumblebees, and the same thing with monarch, and then the butterfly category. You don’t need to double count a monarch in the butterfly category. Count it in the more specific category and leave the general categories for other observations of species that aren’t a monarch or a bumblebee specifically.

**[32:17 NR]** And this is just a best effort. Don’t stress about it. “I don’t know what these are, they all look the same.” Your best effort that you can get for us. That’d be awesome.

**[32:25 CB]** We’re trying to understand the associations, again, so. You know, if it’s 20 bumblebees or 25 bumblebees and you’re not sure, you know, exactly what it is.

**[32:38]** If we see, you know we’re looking for a lot of associations between the flowering plant species and the group of pollinators. And over plot after plot, year after year, these numbers will really start to aggregate to mean something.

**[32:53]** In a single plot, one observation visit, you know, you get limited information because of the limited time. But just remember over time and space this aggregates into useful information.

**[33:07 Section C3 Slide NR]** All right. And this is the new section we added this year. This is where we’re trying to note those unique pollinators on site.

**[33:13]** So in previous section we were counting everything, every individual. We were trying to quantify how many individuals were on plot

**[33:18]** Now in this section we are trying to quantify how many unique individuals, or how many unique morpho species, or unique looking families. I mean whatever distinguishable features you can delineate, individuals you observe.

**[33:33]** This is the section we are trying to [inaudible]. So if you see a green bee and you see a black bee or you see something that doesn’t look black it’s not as shiny as that other bee, but you can delineate that you’re seeing distinct individuals.

**[33:47]** And they don’t all look the same. So this is where we’re trying to figure out how many unique individuals you are seeing per, or unique types of individuals you’re seeing – those morpho species to where you can distinguish between individuals.

**[34:04]** And we’re trying to provide an estimate, again, this is your best guess, of how many unique individuals or unique types of pollinators you’re observing.

**[34:14]** and then also we’re giving you plenty of notes sections to where you can write out as many of the species identifications you’re making, or genera identifications you’re making

**[34:25]** So if you’re able to identify every single species or genus of bee or butterfly. Or if there’s a common butterfly that you’re on the watch for, and you observe that on the plant and you know the species name or the genus name, feel free to record that in the notes and just make a big long list and that’s always a helpful piece of information for anyone that might . . . any entomologist that might look at this data set. Or the biologist local in that field office if they’re concerned about a certain thing, and you actually saw it, they can go [inaudible] that information or they can go back to the site and do some more intensive investigations to figure out if that species was there and how abundant they might be in the field office.

**[35:11]** So again, this is, again, a broad scale estimate and you’re just making your best effort of delineating between how many different native bees you see

**[35:22]** And how many different bumblebees? If you see one that’s all yellow and black and one with a little orange on it, you might be able to distinguish the couple of bumblebees you see on site as being two distinct and not all the same.

**[35:35]** And then also, with honeybee and monarch, there should only be one in there, ever. If you see it, it should always default as one. We’re not delineating between workers, and queens, and monarch queens.

**[35:52]** I don’t’ know if we want to delineate that, but If you see a monarch you’re just going to say, yeah, we saw a monarch because that’s always a species of its own.

**[36:00]** So just make a note of that. If you’re saying you’re seeing four different honeybees then you might want to re-think that. So just remember that, remember that on those two values.

**[36:12]**  All right, Casey. Go for it.

**[36:13 CB] Optional Sections D-I CB]** All right. Thanks, Nathan. We just had a quick question about some of the headings being grayed out.

**[36:19]** I answered that in the chat but I’ll just say it now, too. Those sections are all optional and you’ll see that throughout the document, in the phenophase section rows 11 through 15 are gray because we want at least flowering 10 species if they’re there, but if you want to record more we’ve made room for 15.

**[36:39]** The flies are gray because telling flies apart is really hard, but we wanted to leave that there just in case people wanted to give it a shot.

**[36:45]** So we left room for these things in gray but they’re not necessarily expected that you do them. They’re just made available for you to consider.

**[36:55]** So that’s kind of the meaning of the gray headings throughout the document.

**[36:59]** I’ll hit the sections D through I pretty quickly here. These are also optional, optional sections and they’re put on a whole separate tab on the Excel sheet just so people know these are not required.

**[37:15]** And I believe, Robert correct me if I’m wrong, this crew will not be expected to do this section, but I’ll just touch on them really quick so you’re aware of them.

**[37:23]** These are other factors that are related to the site and its context and its land use history that may be valuable in understanding the pollinator species populations and habitat.

**[37:41]** So, you know you guys are there for one day getting a snapshot, but obviously things are happening around that site, and you know, the landscape that are affected and things that are happening in the past in terms of treatments, vegetation treatments or disturbances, that can also affect the the site and the habitat for pollinators as well.

**[38:02]** So this is information that the field office is more suited to fill out. There’s some stuff that you could fill out on here and it’s up to local direction for you guys to do any of these sections, so I’m not going to get into them any further unless I’m mistaken and you guys will be covering these but for the sake of time I will move on.

**[38:25 RP]** Yeah, you’re right. We’re not doing those. Thanks, Casey

**[38:28 CB]** OKGreat, thanks. Ok so I’ll pass it back to Nathan for the data collection and compilation section, here.

**[38:38 NR Data Collection and Compilation Slide]** Ok. Thank you, Casey. So this new section of this method was added this year and this is sort of to make data aggregation from the field crews perspective a little bit easier.

**[38:52]** So you’re not managing 15 or 50 different APSI form or Excel versions, or tabs, whatever it may be or however you’re managing the data.

**[39:02]** This is putting all of our data into a central location, so this allows for you to QC and assure that the quality of the data is up to par, essentially.

**[39:12]** There’s multiple domains or set values that we’re expecting in certain fields. There’s certain, like the office names and then all of the optional data, there’s some of the number values need to be number values and not text values.

**[39:30]** We’re trying toprovide you a structure to where you can QC all this data relatively easily. And then it can get aggregated at the state level, at the field office level, at the national level a lot easier.

**[39:44]** If you haven’t already, you’ll, basically understand that this QA/QC process from the AIM side of things because that is a big portion, or a big part of the AIM program is this data is constantly OC’d.

**[39:57]** It’s QC’d in the field, it’s QC’d when you enter the data, it’s QC’d at the state level, it’s QC’d at the office level, it’s QC’d at the national level.

**[40:04]** So that by the end, by the time this data is published, by the time this data is presented to the public or to the BLM as a whole, it’s been OC’d multiple times and it’s a data set that you can trust, that you can some confidence behind it.

**[40:21]** And that’s the same idea we have going behind this data set. We want to ensure this data is being collected in a manner that instills confidence and not uncertainty

**[40:31]** And then all this data is going to be stored whether locally at the state or field office or remotely on the cloud [inaudible] interface, or at the NOC or at some other data repository that the BLM has available to them.

**[40:48]** But it will be aggregated within our teams, within the pollinator coordinators team soon after the data is submitted to the group

**[40:59 – Dark Screen]** And then now I’m going to switch over to the Excel and just basically walk you through what is going on in regards to the Excel.

**[41:12 Excel Spreadsheet slide]** So example data sheet for sure, I mean, this isan ideal way to figure out how to fill out the data sheet.

**[41:17]** But thereafter is the first data entry form. So this is going to be outlined for you for every section that you might be pulling data from.

**[41:27]** And so this is a big, long Excel for this one section. And then the species entry form is basically pulling all your species data, just like you would do for species richness but it’s associating it with everything that associated with that specific species will be in this form

**[41:44]** So it’s parts of Section B and parts of Section C2. But this way you can basically, hopefully this makes data entry a little bit simpler.

**[41:53]** So you know exactly what section you’re looking for and where those values are.

**[41:59]** So right now this Excel is not set up for data validation with drop downs. But it’s easy enough to set that up for your field office and for your plots.

**[42:10]** So it’s easy enough to go back into your data schema or into another tab and fill in all your plant IDs so that you have those drop downs available for your crew.

**[42:19]** I don’t know if the crew lead does that or the project lead does that or the state lead does that.

**[42:24]** I mean that’s one way you can do it just to make sure that your formatting is consistent across all data entry avenues.

**[42:33]** And soon enough we’ll have a Survey 123 form where you’ll be able to do this as well once the state switches over to that data entry mode.

**[42:40]** But this, hopefully you’ll be able to enter all 50 plots or all 60 plots into this one data form and have a two-sheet workbook.

**[42:50]** and that’s all you have to submit to your project lead for QC, or that’s all you have to submit to your state lead for QC.

**[42:57]** And really the QC is on the pollinator coordinator side of things. They’ll look at this data and make sure it is accurate and we’ll append some of the AIM data once it gets QC’d on the AIM side of things to add to this data set

**[43:13]** But the one thing about QC is we’re trying to be consistent with what data entry we’re putting in here

**[43:23]** So if you could use these data types, or these domains, when you’re filling in the data and most of this is for that optional section which you might not be doing, or it sounds like you won’t be doing.

**[43:42]** But some of it is worthwhile. I mean, I guess your wind force is pretty self-explanatory, but your state species list is going to be critical.

**[43:51]** I just got a question that one of my codes wrong which is critical when we’re putting in our species in here.

**[44:00]** So just keep that in mind that you want to use whatever code that you’re using for AIM.

**[44:09]** So, if you’re using a certain species code for AIM that’s the species code you want to do, put in here.

**[44:15]** And as long as that’s the correct code, we can always define the species name from the species library, or the state species list that Robert’s put together for Oregon/Washington.

**[44:27]** And the same goes for every other state since all of those state species list have been standardized for each state.

**[44:36]** So if you just put the species code in there the species name can be calculated after the fact. So just keep that in mind.

**[44:42]** Casey had mentioned the office codes and so you can just basically look for your state and find the appropriate office code to enter in when you need to.

**[44:53]** Yeah, so that’s the new data entry protocol. We just kind of want to make it a little easier for data entry, and it’s all into an Excel as of right now.

**[45:03]** And then you’ll basically give this Excel to the project lead. And then the project lead will aggregate it up to the state lead and the state lead will share it with the pollinator coordinator

**[45:16]** And then that will all get aggregated up to the national level as well.

**[45:19 CB]** This is a huge step forward this year. We’ve kind of been doing this more individually each year and this is going to help us, help everybody do it more efficiently, and help us be able to roll this up nationally a lot easier.

**[45:33]** And make some larger data sets with some larger conclusions. And so this is a big positive step. I’m excited about this kind of on the back end trying to make some summary report nationally for this effort, so thanks, Nathan

**[45:53]** All right. Last call for questions and then we’ll move on. All right.

**[45:57 attendee]** Sorry, can you hear me? I could see potentially the time frame during this collection being different. Maybe somebody has more time; maybe they’re doing it as they’re doing the plot, the entire time they’re in the plot. Is it specifically supposed to be a specific time frame to keep the data like uniform, or is it just the more data the better? If you understand my question.

**[46:27 JD]** So you should, this is Jessa. Soou should spend a dedicated amount of time to it. I mean, I have questions about workflow if you’re doing it the whole time.

**[46:38]** So kind of treat it the same way as you do species richness and species abundance. So while, say, you know while two people are running LPI, the third person is doing species richness and abundance or the third person is doing the pollinator supplemental form.

**[46:57]** So try and dedicate the time. If you do have additional time, you know, maybe make note of that. But I think you need to dedicate a start and a finish, mostly for efficiency sake.

**[47:10 attendee]** Right. I guess I’m saying like if you’re doing LPI and you see a monarch on like a thistle or something, you might be like tempted to make a note of that and add that to your data sheet, but that might be like, if you’re doing that the whole time that might flaw everything. So are you not supposed to be doing that? Probably, I guess.

**[47:30 JD]** No**.** I guess that’s a valid point

**[47:34 CB]** This is Casey. I think that would be a note vs. something you would actually put in your survey information

**[47:43]** So you definitely want to capture that, especially if it’s a monarch, you want to capture that you saw it on site on the plot,

**[47:50 Section C2 slide]** But that would go in, I would recommend that you put that, if you know what plant species it is, you know 1,2,3,4, . these numbers associate with the names in Section B, put it over here in this note section on the far right associated with that plant species that it was observed outside of the observation period.

**[48:09]** So you can see we have the time begun and time ended at the top right of Section C2. And so, Jessa mentioned you know, we’re trying to control the total amount of time spent is a big factor.

**[48:23]** But we’re also trying to capture survey effort, and you know we don’t want to compare a plot with 5 minutes of observations to a plot with an hour of observation, necessarily.

**[48:33]** So unless, Jessa or Nathan, has a different recommendation, that’s what I’d go with. But that’s a really good question.

**[48:41 attendee]** Thanks, makes sense.

**[48:43 CB]** All right, So we’re just getting to the wrap-up section now and I just have a few tips that I wrote down here and I’m just going to welcome Nathan and Jessa to add any more tips that you guys might have after I go through these.

**[48:56]** But I want to emphasize the example data sheet tab. It’s really, I think it’s really helpful to answer a lot of the questions we’ve had over the years.

**[49:07]** If you look at the example data sheet a lot of the questions could be answered that way. So take a look at that if you have any questions first and just see how its done there and that might give you some insight on what it’s supposed to look like.

**[49:21]** Especially you’re first couple of times that you do this it’s going to be a little bit awkward but by the fifth time to the 120th time you’re going to be pros at this and you’ll be as good at this as the rest of us.

**[49:34]** So just getting started especially, you know, have a copy of that handy, either electronically or printed out to take with you to the field to look at.

**[49:42]** And calibrate with your team and between teams if possible, too on this. Ideally maybe the same or similar person is doing this every time.

**[49:50]** Or if you’re going to rotate who’s actually doing this, who’s observing and who’s recording these things, maybe spend the first plot or two doing it in a larger group so you’re all on the same page with how you’re doing it.

**[50:03]** You know it’s harder to calibrate between teams and between states and all that, but the very minimum, you know, within your team, ideally you guys are kind of on the same page about how you’re doing this

**[50:15]** And then if you had anything that came up with your team, or questions, or things that we may need to change afterwards to kind of know that it was all done in the same way, and we can go in and see how you guys treated that and make wholesale adjustments, if necessary on the back end.

**[50:29]** So be consistent, you know, it is important. Take notes, Nathan mentioned that a few times, you know, there’s a lot of spaces for notes on here

**[50:38]** And those will just come in handy later with various issues. So feel free to fill those up as much as you’re prompted to with your brain with thoughts or questions or observations along the way

**[50:50]** And then it’s okay with me and I’m going to offer up Nathan and Jessa too, if you guys have questions, get in touch with us through the proper channels of course.

**[51:02]** You know, you would probably call Robert and all the people you’re supposed to call first. But from our end, at least, I’m willing and I’m pretty sure they’re willing to chat with you guys along the way.

**[51:11]** You know, we’ve put a lot of time into this and we’re really committed to having it done as good as it possibly can be

**[51:18]** So I think that means we’re willing to help you guys as much as you need to get it done as good as you can with the time you have in the field

**[51:27]** I guess I’ll ask you, Robert, if there’s anything you’d like to say and we can see if there’s any other general questions here before we wrap up.

**[51:36 RP]** No, no, there’s nothing I have. Please feel free when you guys are out in the field to just, if you have a question, cc me on anything if you want to go directly to Casey, or Jessa or Nathan, you know to get the answer quickly.

**[51:54]** But thanks for doing this. We really appreciate it

**[51:57 CB]** Oh, you’re welcome. Like I said at the start, , we’re happy to do this. You know, we’ve been kicking this around, this year even, with all of the delays for the last two months, we’ve been, we’ve been ready to do this for a couple of months this year.

**[52:11]** and it feels good to do this and hopefully set you guys off on the right foot this year your heading out to the field

**[52:18]** So I guess we’ll just open it up one last time to see if people have any questions or comments before we wrap this up.

**[52:29 attendee]** I have a question. This might be for Mike and Caitlyn but is there something we’re going to be able to take out on the field, like a general identification of bees and flies and how to differentiate between some of the mimicry in stuff that we see?

**[52:44 attendee]** Yeah, there’s a couple of pdfs we’re going to have in the tables, like some of the pdf ID stuff that we gave you. Not too extensive, but there’s one thing about bees and flies and how to tell them apart and that’s one of the harder steps, but we’ll have something for you.

**[53:06 LY]** Casey, there’s a question on the chat.

**[53:10 CB]** Can you just read it Lori, is that okay?

**[53:16 LY]** Sure. What are the guidelines for calibration for this protocol?

**[53:22 CB]** You know, I don’t think we’ve established anything specific. You know, this training is a good start in having everybody being familiar, you know, with the instructions and the data sheet before going out in the field is good.

**[53:35]** But my recommendation like I mentioned is to, especially if you are going to be rotating who does this is to spend the first couple of times in a little bit larger group so you’re all on the same page if you start taking turns doing it.

**[53:49]** In an ideal world, like if you guys have been to the AIM training, you know there’s field practice together and all that, but we know that that’s not possible for us to get out to do this with you all, everywhere, all the time.

**[54:05]** So that’s my thoughts on calibration. Jessa, Nathan anything to add?

**[54:11 JD]** I don’t know what the guidelines are right now for people going to the field. I mean, obviously you guys are going out.

**[54:18]** If you have time, go out and look at stuff, or see if you can get your hands on some museum collections online to look at some things.

**[54:30]** Or just do a walk-about, kind of like how you do plant ID the first few times is you just walk around and look at things together.

**[54:38 CB]** So I see another question here from the other Casey B. Should we note nests? And I think that’s a great point, a great question, and a leading question, I think is that yes

**[54:51]** That’s a great thing to note. If you see, you know, a bumblebee nest, or you know any sort of ground nesting bee observations on site.

**[55:02]** You know any sort of honeybee nesting of course if there’s like an apiary on site. All that stuff is great to note and highly valuable information if you guys can find any of that.

**[55:16]** Definitely note if you see any nests on site

**[55:19 NR]** Those notes would go in, like Section B, where you have your plot level observations or notes. But really, anywhere you can remember to write it down is appreciated. We’ll parse it out later on.

**[55:35 LY]** Ok Casey, for the benefit . . . since this is being recorded, for the benefit of those that may watch this later, we had questions in the chat that were answered in the chat, so perhaps we can just go over those real quick.

**[55:47 CB] Sure.** Do you want to do that, Lori, or do you want me to?

**[55:53 LY]** Sure I can tell you which ones. One question was, do you see many wasp pollinators out there? If you guys just want to answer this verbally rather than reading the. . .

**[56:03 CB]** Yeah, go ahead Jessa, I saw you answered that.

**[56:08 JD]** Yeah, they’re more of an incidental pollinator, they’re not there to get food necessarily, I guess, plant food.

**[56:17]** They will be there to like eat other insects. They’re not there for pollination purposes, I guess if that’s the question.

**[56:23]** I mean we do have quite a few wasp species in the Great Basin, if that is the other part of the question.

**[56:31 CB]** All right, Lori, anything else?

**[56:35 LY]** Somebody just wanted clarification on “you can’t do pollinator and species walk at the same time by the same person.” I think this goes back to Nathan’s maybe section.

**[56:50 JD]** Right, I think I answered that one. My recommendation is no. Only because, you know, how many times do you get to a plot and you know, everybody sits down and you start like half your species list, you know, the big stuff you notice right at plot center.

**[57:07]**  And then you do your species walk, you know, toward the end, you’re missing out on some of the more focused insect observations on the more obvious species.

**[57:21]** So say you’re in a saltbush site and you’re like, oh well I’ve got saltbush and you’re prepopulating your species list for all the other methods

**[57:30]**  I think it would be more beneficial to take that time with two separate people or done individually, so that you can have those more focused observations for insects.

**[57:44 LY]** Goes back to the phenology stage part of the data sheet and I don’t, I just want to make sure that the question was answered.

**[57:56]** The question was the percent cover of phenotype that is wanted. The original question was, if one plant has flowers and buds which do we pick? You guys answered that one.

**[58:06]** And then it was just a clarification, I think. So it’s the percent cover of phenotype that is wanted.

**[58:12 JD]**  Yeah, we answered that.

**[58:14 CB]** Yeah, like Jessa said, kind of think of it as the plot level percentages. So I think, yeah, I think that’s good.

**[58:24]** So I just wanted to say, I guess to wrap this up, Robert, thank you for engaging with us to do this training, and thanks to you and your counterparts in Oregon for implementing APSI this year.

**[58:39]** There’s a lot of you know, momentum, right now on gathering more information, understanding our pollinators and their habitat better. And you guys will be helping to contribute to that’

**[58:52]** So thanks to Robert and the Oregon state folks and the crews there for doing all this. We really appreciate it

**[58:59]** And one other thing I’ll mention, is keep your comments in mind for how to improve this.

**[59:07]** So feel free to write those on the data sheets, on the sides in the notes section, while you have thoughts try to capture them and funnel those to Robert

**[59:19]** Because we’ll be getting back with him at the end of the field season to do a little debrief and see if there’s any recommendations on improving this.

**[59:29]** So, we’re, like, I said, every year we’ve taken those recommendations and tried to make this better, so please keep us in mind and let us know what you think we could do better.

**[59:40]** So thank you all

**[59:43 RP]** Thanks a lot. Really appreciate it

**[59:45 CB]** Great. All right. Anything else from anybody before we call it a day?

**[59:51 attendee]** I do have a question. Not to get too bog, slowed down on semantics but I could imagine doing this and seeing one bee kind of bouncing around between a bunch of plants and was wondering how, I imagine you just kind of make a note of that?

**[1:00:09]** Or, like how, if you know it’s just one bee but you know all of the plants he’s in, If that question makes sense.

**[1:00:18 CB**] Yeah, I think that’s a good question. I’ll try to answer that and then, Nathan, Jessa, please add on.

**[1:00:24]** I think if you do observe a single bee, individual, visiting multiple different plant species, you’ll want to tally it for each of those plant species. Anything to add, Nathan, Jessa?

**[1:00:42** **JD]** No, I would agree

**[1:00:47** **CB]** Yeah, he could get double, triple counted potentially, but we’re looking for those associations between the pollinators and the plants, so it’s more important that we capture the visits to the plant species, than we worry about double or triple counting an individual like that.

**[1:01:09]** But that’s a good, fair question, though, for sure. All right. Anything else? All right.

**[1:01:15]** Well, good luck with your preparations and have a good field season if you guys can get it all pulled together. Best to ya. Thank you, take care.