

Final Portfolio
Advanced Environmental Education
Unit: Birding and Ornithology

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Initial Unit Proposal

Overview- In order to display my skills in education in the environmental field, I will be leading a unit on birding and aspects of ornithology. The unit will be advertised through UCSB Birding Club. The five lessons I will teach will be aimed to inspire, in college students, a love for birds by providing a platform to engage with birds and birding in whatever way speaks most to the individual. The unit will include general birding basics for the casual birders, more advanced birding techniques for those interested in building a life list of bird species, scientific methods for bird studies, and using birds to connect with nature in a fresh way. There are a lot of methods to enjoy birds and I hope to provide a starting point for my peers to follow their own birding journeys in any way they resonate with.

Lesson #1(introduction to birding)- The first lesson will be all about the basics of birding. The group will embark on a birding walk during which they will have the help of the Merlin Bird ID app and pocket guides to identify birds they see. As we walk, I will be a resource to help beginners figure out these identification aids. We will occasionally group up to discuss helpful information such as looking at color, size, and shape as indicators for identification, and we may deliberate over hard-to-identify birds. The goal of this lesson is to encourage students to become aware of birds in their daily lives, and to gain preliminary knowledge of how birds move and act. At the end, we will finish with a discussion to ensure everyone is on the same page, and will start a class bird species list to build on in each lesson going forward.

Lesson #2(intermediate birding)- In the second lesson we will once again take a walk with binoculars and field guides, since I believe the best way to learn about birds is to see them for yourself. As we walk, we will dive deeper into techniques for finding and identifying birds. We will look at differences in plumage for males, females, juveniles, and breeding individuals, discuss tells for the presence of certain birds (like crows making a raucous over a hawk), and focus more on bird calls in preparation for next week's lesson. After the walk, we will go over the parts of birds because proper vocabulary shows you know what you are doing and helps communicate about unidentifiable birds. We will once again add to the ongoing class bird list, as a way to remind students of the names of birds we saw.

Lesson #3(bird calls and introduction to citizen science)- Now that students have a better sense of the birds they may encounter, they will learn how to conduct bird counts for scientific purposes. We will discuss citizen science and its benefits, then go over how to conduct a stationary bird count. The students will then couple up, or go alone, to a place with as little noise and distractions as possible to conduct a 15 minute bird count, going by sight and by Merlin sound ID. We will then reconvene and compile data. If there is time or interest, we will talk about bird feeders, since some of the coolest birds could be right in our backyards. Once again, we will add to the class bird list.

Lesson #4(shorebirds and walking counts)- The goal of this lesson will be to familiarize students with shorebirds as well as build upon citizen science. We will review the parts of a bird as this is especially important for shorebirds who are often difficult to differentiate. I will then explain how we will conduct our walking bird count along the beach. As we go, I will allow students to take the lead in identifying birds. Following the count, we will have a discussion about bird conservation and our responsibility as birders, centered around the snowy plover. Again, we will finish by adding to the ongoing list.

Lesson #5(advanced birding)- If I get to my final lesson, I hope to go on an expedition to find a specific rare bird. I will do preliminary research to see if there was a recent sighting of a rare or especially cool bird. I will coordinate with students to drive to the location where we could find that bird. As we search, I will explain what resources I used and what they can use in the future if they want to find a very specific bird(audubon, inaturalist, etc.). I still have not made it to this point in my birding career so it will be a learning experience for all of us, and hopefully we can add a rare bird to our list.

Method of Assessment- I will assess students' learning after each lesson in a few ways. For one, at the end of each lesson when we add to the bird list, I will ask students to call out the birds they saw and for some of the more confusing ones, I may ask someone to describe it to practice maintaining the image in their mind and communicating what they saw using proper vocabulary. Because I am teaching fellow college students and because birding is already a relaxed and informal topic, the main way I will assess students' knowledge and engagement will be through talking to people throughout the lesson. But to have a physical representation of what they learned, I will ask students to fill out a google form following each lesson that includes questions about what we learned that day, and even simply ask if they feel that they learned something new.

In-depth Lesson Plans

Instructor- Daniel Marin

Audience- College students

Setting- Local parks in biking distance, Sundays at 8:30 am

Amount of Time per Lesson- 1.5 hours

Materials Provided by Me- Binoculars, bird field guide, whiteboard and marker, pens and paper

Lesson 1(Introduction to Birding):

Meeting Location- Tierra de Fortuna Park, Isla Vista, CA

Management Considerations- Teaching will mostly consist of walking and talking, allowing as much time to look at birds as possible and to create an informal setting that college students will feel comfortable in and can effectively learn from in a way that provides a break from traditional classroom settings.

Curriculum Goal- Students will start noticing birds in their daily lives and be able to identify common birds in their local environment.

Cognitive Objectives- Be able to identify birds using binoculars, a field guide, and/or Merlin ID.

Affective Objectives- Find a deeper connection to birds and to nature through birding.

Step-By-Step Procedures(using the natural learning cycle):

East- I will start by thanking everyone for coming and giving a quick explanation of what we will be doing for the lesson (where we are walking, what types of birds we might see) to get students prepared and excited. I will also ensure everyone has Merlin ID downloaded so everyone can

participate in the later activity. If they do not, they can simply download it at this time and have it ready when we need it about 45 minutes into the lesson.

Southeast- Then we will do a stretch circle as an ice breaker. Each person will introduce themselves how they wish and then give a new stretch position for everyone to try (because birding can be strenuous! haha). I will go first.

South- Then we will begin to walk, and go about a quarter mile. There I will give a quick binocular explanation, highlighting the important parts about my own binoculars like to pop out the eye pieces if not using glasses(it will be necessary at this point to explain the calibration technique). I will also talk about Merlin ID and some of the basics of how to use the field guide I have. This will be a time to allocate the materials we have(since there are likely less binoculars and field guides than people), and see if anyone has any questions before we start looking at some birds in that area.

Southwest- Then we will move on again to diversify the locations and show what types of birds will be most prominent in different places. As we walk, we will stop when we see birds. I will encourage engagement by asking a specific person, someone who seems like they may have a bit of experience, what bird they are seeing(for them that could be a level 1 question). As we move on and see more birds, I will encourage individuals to rotate between using Merlin and a field guide since both are beneficial in different ways. I will essentially be a roaming resource for questions, and I will challenge students with questions of my own. Like, what is the most noticeable characteristic of the bird you are seeing, or what tells you it falls under the category you are looking at? This format should naturally address all 4 learning types.

West- West will be interjected in southwest. At some point on the walk I will gather the group to reflect a bit on what they have seen and to make sure everyone is on the same page. I will ask questions about size, shape, and color of birds we saw that may be hard to differentiate from others. I will also ask questions about the actions of birds we saw, and why they may have been doing that, drawing notice to the fact that birds all act very differently and that is an indicator for what they are if you cannot discern their physical features.

Northwest- To appeal to the more spiritual side of birding, I will ask students what bird they identified with most and why, using my own description of a bird to base their answer from. The thing I want to stress here is that birding is not only about racking up a list, but it is about relating with the environment in an alternative way, and a way that many people do not learn to appreciate.

North- With that being said, I will still make a birding list. I will have students call out names of birds we saw that day so I can add them to a class list that I will keep adding to for the rest of the unit. This will be an opportunity to remind students of what they saw and clarify names of anything they may have forgotten.

Northeast- I will pass around a sheet of paper for people to write their emails so I can send a google form with assessment and evaluation questions. Finally, I will let students know the plan for next week's lesson.

Assessment- I will send out a google form with questions to assess what students learned. Most of the questions will be things they were already prompted for during the walk, but it will be good for me to have a physical copy. The following will be the student assessment questions on the form:

What aspect of the lesson did you find most engaging, exciting, informative, etc. ?

Since the lesson, have you noticed birds more as you move around in your daily life? Any fun observations to share?

Here's the fun part. Name a bird you saw during the lesson. What family does it fall under(find its grouping on Merlin ID if you need)? Describe it(plumage, size, what was it doing, etc.)

Now write a haiku about the bird you mentioned above.

Lesson 2(Bird Calls and an Introduction to Citizen Science):

Meeting Location- Tierra de Fortuna Park, Isla Vista, CA

Management Considerations- Ensure everyone has Merlin ID downloaded as it will be especially important for conducting a bird count.

Curriculum Goal- Students will continue to get comfortable identifying birds, using bird calls as a new technique for doing so, and will get introduced to a method of citizen science.

Cognitive Objectives- Understand how to conduct a stationary bird count.

Affective Objectives- Start noticing bird calls in their daily lives, and recognize some calls.

Step-By-Step Procedures(using the natural learning cycle):

East- I will start by welcoming any students who did not come to the last lesson and gauge their experience with birding as I have them introduce themselves to the group. I will also pass around a piece of paper to get emails for sending out the google form.

Southeast- I think my students liked the introduction and stretch circle in my first lesson as a more creative way to do an ice breaker, and it allows casual discussion that I can initiate, so I will do that again. I will then explain what we will be doing for the lesson(practicing IDing bird calls, discussing importance of calls, conducting a stationary bird count).

South- Then to get our birding brains warmed up, we will walk around Camino Corto open space for about 15 minutes mostly just to look for birds. This will remind students of what birds they saw in the last lesson and how to ID them, and they may see some new birds that they should know for the lesson's main activity, since we are birding in a slightly new place from last time.

Southwest- After about 15 minutes, I will do a bird call ID activity. I will have each student walk around for about 5 minutes listening to bird calls. They will choose one that they could make out pretty well and try to spell out how the bird call sounded and describe it a bit. When they return I will have each student describe the call they heard based on what they wrote down, and other students may be able to say they heard that same bird.

West- Next, we will circle back to where we started in tierra de fortuna park, where I will explain how the stationary bird count will work. First I will do a really quick activity, having students walk the distance of what they think is 50 meters just so they have an idea of that distance. I will explain that we need to know that distance because that will be the radius of our bird count(only birds within that radius will be counted). Then, students will pair up, or go alone if they would like, and find a spot to sit within Camino Corto Open Space near the line of trees. They will quietly wait for 5 minutes to allow the birds to repopulate the area. Then begin their merlin sound ID recording. For 10 minutes they will write down the name or description of every bird they see or hear(using tallies to note multiple individuals of a species). They can compare their notes for calls to what Merlin picked up. I will explain that a lot of birding and bird counts are not an exact science because birds move so much, and nobody here is an expert birder and will know all the birds. So they will do the best they can, counting birds that they believe beyond reasonable doubt were there. When we all come back together, I will ask students to take a minute to see if they can figure out what they heard and how many birds they heard by talking to me and by comparing to Merlin.

Northwest- We will then circle up and talk about some of the frustrations there are with listening to bird calls and also trying to figure out if the same bird is making that call, or if a bird should be counted multiple times if it leaves the area and then comes back. This is to once again emphasize that bird counts and birding in general are not an exact science but a science nonetheless, so a lot of it is about qualitative analysis(how healthy does the area feel based on the general composition of bird populations)

North- With whatever time remains, we will go on a typical bird walk which will allow the students to keep asking me questions and engage in discussion while we look for more birds. This will be an important time for students to focus in on a few of the easier birds to identify by their call, so that hopefully they'll remember a few distinct calls after the lesson.

Northeast- Once again, we will go over any new birds we see that day to add to an ongoing class list. And we will talk about the plan for next week's lesson.

Assessment- I will send out a google form with questions to assess what students learned. Most of the questions will be things they were already prompted for during the walk, but it will be good for me to have a physical copy. The following will be the student assessment questions on the form:

What aspect of the lesson did you find most engaging, exciting, informative, etc. ?

Is there a bird you can now ID based solely off its call? What bird is it?

Do your best to transliterate the call of that bird. Then describe the call.

What was the point in waiting 5 minutes before starting the stationary bird count?

Lesson 3(Intermediate Birding):

Meeting Location- North Campus Open Space(South Entrance), Goleta, CA

Management Considerations- Ensure everyone has Merlin ID downloaded as it will be more important than the first week since we are focusing on bird calls. Teaching will mostly consist of walking and talking, allowing as much time to look at birds as possible and to create an informal setting that college students will feel comfortable in and can effectively learn from in a way that provides a break from traditional classroom settings.

Curriculum Goal- Students will become more familiar with local birds, and be able to make assumptions about what birds they may expect to see in what places.

Cognitive Objectives- Students will begin thinking about more advanced ways to find/experience birds through observation of other natural factors.

Affective Objectives- Students will develop what it is they want to know about and pursue further within birding.

Step-By-Step Procedures(using the natural learning cycle):

East- As students arrive, I will gauge their experience in birding as they introduce themselves to the other students. For those who are new, I will update them on what I have taught in the first two lessons and anything else they should know before starting the lesson.

Southeast- Now that we are on our third lesson and students who have attended the first two have had a chance to learn about birding, think about it more in their daily life, and come back to learn more in other realms of birding, I want to ask what they have related to most so far in birding. Or if they have related to birding at all (I am guessing they do if they keep coming back). I also want to hear about their coolest encounter with a bird because I have a good story to tell about a recent experience of my own where I specifically went looking for a bald eagle and found one as well as a peregrine falcon. It was my first time getting intel on a bird and actually going searching for it and finding it. This will be a segue into what I will talk about in 'South'.

South- As we walk, I will explain some of the resources we have to look for birds. I found the bald eagle just by talking to an experienced local which is one great way to find birds. But, there are also online resources where people post what they have seen and where, like eBird, iNaturalist, and Audbon. The point of doing this as we walk is because we are in a new location and I want to maximize the time we have to get to the best spots to see birds since the area is open and a lot of the birds will be among the trees.

Southwest- At our first stop, I want to talk about the parts of a bird. Something I noticed in the first lesson was that students did not notice as many distinct key factors of a bird's look because they did not know what to look for. Or they did not know how to describe what they were looking at so they were not as specific. I will use my whiteboard to draw a rudimentary bird and label its parts. This will highlight some of the key body parts on a bird where you will notice the most distinct plumage, including the crown, nape, belly, rump, bill, tarsus, breast, eyeline, browline, primaries, secondaries and tertiaries(of the wings), and coverts. I will emphasize that saying 'bill' instead of 'beak', for example, will make them sound like a more experienced birder if they talk to other birders on their adventures. I will also discuss how birds that look similar, like a house wren versus a bewick's wren, can be identified more easily by breaking it down into their constituent parts. For these birds, the plumpness of the belly(house wren is more plump) as well as the bill size(house wren has a bill with a wider angle) are good indicators. I will then erase the labels and have the students tell me the names of various parts I point to just to make sure they retained what I said.

West- Then, to have students practice what I just showed them, I will have them spend 5 minutes to find some birds and write down everything they notice about one specific bird, using some of the proper terms they just learned. When we circle up again, I want them to orally describe it to me and to the group, so maybe others can identify that they saw the same bird and may know the name of it. I will ask questions to prompt them to go deeper in the description or to help them get closer to figuring out the bird on their own, like what was the shape and size of the bill? Did it have distinct colors in its wing or tail plumage?

Northwest- At some point I am going to bring up how we can use other natural indicators to find certain birds and ask more questions about them. I will use the example of crows, first starting with an anecdote about how my house is currently dealing with a loud crow that caws in all hours of the day and talk about what the solutions we found were, because they were not what was expected. Then I will talk about how you can often see crows pestering large birds of prey, and will ask students why they think that is. While it is an evolutionary action by the crows, for birders it is a helpful indicator that there is something cool to look at.

North- Toward the end of my first lesson, the students naturally started asking a lot of questions, some about what I told them and some other general questions they had thought of about birds so I plan to make sure I leave a stretch of distance back to our starting point to allow time for those questions to be asked.

Northeast- When we get back to where we started I will have everyone tell me the birds we saw so I can add new ones to the list.

Assessment- I will send out a google form with questions to assess what students learned. Most of the questions will be things they were already prompted for during the walk, but it will be good for me to have a physical copy. The following will be the student assessment questions on the form:

Name a new bird you saw in the lesson or since then and describe it. Try to use some of the proper terms we talked about in the lesson(coverts, primary feathers, rump, etc.).

Part of birding is building awareness. Its about asking questions, not just IDing birds. Have you noticed something interesting about a bird's activity that prompted you to ask a question? What was the question?

Name the following parts of a bird.(There will be an animated picture of a basic passerine bird with arrows labeled A, B, and C pointing at three different parts of the bird).

Lesson 4(Shorebirds and More Citizen Science):

Meeting Location- Coal Oil Point, Isla Vista, CA

Management Considerations- Ensure everyone has Merlin ID downloaded as it will be more important than the first week since we are focusing on bird calls. Teaching will mostly consist of walking and talking, allowing as much time to look at birds as possible and to create an informal setting that college students will feel comfortable in and can effectively learn from in a way that provides a break from traditional classroom settings.

Curriculum Goal- Become familiar with coastal birds, so that students have a starting point to start birding on the beach.

Cognitive Objective- Understand how to conduct a coastal bird count with three or more survey points along a beach, and know where to post citizen science to assist the scientific birding community.

Affective Objective- Learn what is threatening coastal birds and how students can prevent further damage to species.

Step-By-Step Procedures(using the natural learning cycle):

East- We will be meeting at the top of the stairs to Devereux beach. Before we head down to the beach I will let students know where we will be going(about 1.5 miles and back along the beach heading west) and that we will be doing a bird count on our way back. I will also have them introduce themselves, of course, and they will say how much birding experience they have and what they like about birding if they do have experience, and each student will give us a stretch to warm up for a nice Sunday morning.

Southeast- I will preface the lesson by saying that shorebirds are particularly hard to ID, but that there are certain birds that have easily discernible features that I will talk about as we walk and see them. I will also say that I am not an expert on shorebirds either, and gulls are especially hard, so do not be discouraged.

South- To get our birding brains warmed up, we will walk along the beach and just stop at birds when we see them. I will answer student questions and have some talking points about specific birds. A student from my last class said they really liked the facts I provided about individual species, so I want to have some facts on hand about the birds we will likely see. For example, cormorants will often be seen posted up on a log or rock, drying their wings because they are inefficient flyers with wet wings. Along with hawks, pelicans and gulls have very different plumage depending on if they are in breeding season or not and even depending on which year of juvenility they are in. Most are considered juveniles for 2-3 years and their plumage changes each year.

Southwest- A friend of mine who is the social media chair for birding club and who has been attending my lessons is a snowy plover docent for the Coal Oil Point Reserve so I have asked her to talk about snowy plovers and population management efforts. I will facilitate her discussion by asking what is threatening them, what we can do to continue protecting them, some fun facts, and what she does for her work as a docent. This will happen about 20 mins into the walk. She told me some of the history she will talk about, like that 40 years ago there were none on the beach, but a few showed up as soon as they put fences up to protect their habitat from humans. Now there are over 200 individuals and about 35 fledgelings(birds with wings developed enough to fly) are produced each year.

West- Just so we're not sitting around talking too much, we will walk a bit further, probably to around the entrance to the pond trail, and keep watching some more birds. There, I will explain how we will conduct the coastal bird count. From where we are, we will walk 50 meters in the direction of Devs stairs(I will use my phone to track the distance). Once we've walked 50 meters, we will stop and count every bird in a 50 meter radius, as a group. I will write down each species and the approximate number of individuals in the species. We will repeat 4 more times. I will allow the students to deliberate on the species before helping them out, so they can test their knowledge.

Northwest- After the count, we will continue walking along the beach while we discuss the bird count(I am guessing we will be tight on time so I'd rather walk and talk versus stopping). I will ask, based on the bird count, does it seem like the beach is healthy? Did you notice a different level of health between the snowy plover protected area and the stretch of beach before the protected area? Then, for anyone who did not attend my first citizen science lesson, I will talk about submitting our findings on eBird and why citizen science is helpful.

North- As we keep walking, we will keep birding, of course. I will answer more students' questions, and if there are students who are still having trouble identifying some of the more common birds, I will pay special attention to them and help them out.

Northeast- Once again, we will go over any new birds we see that day to add to an ongoing class list.

Assessment- I will send out a google form with questions to assess what students learned. Most of the questions will be things they were already prompted for during the walk, but it will be good for me to have a physical copy. The following will be the student assessment questions on the form:

What was your favorite bird we saw during the lesson? (excluding the snowy plover chicks, how could that not be everyone's favorite)

Birds are indicator species, meaning their composition can tell us a lot about an ecosystem. That's one reason why bird counts/citizen science is so important. Based on what you saw on the walk in general and during the bird count, would you say Sand's beach is a healthy beach?

What is one thing that poses a threat to snowy plover habitats?

Lesson 5(Sunrise Bird Walk):

Overview- For my final lesson I will be holding an informal sunrise bird walk for any hardcore birders willing to wake up for a 5:30 am walk. This is the absolute best time to go birding as birds are crepuscular, meaning they are most active during dawn and dusk, but right at sunrise is prime. The likelihood someone does show up is slim, but if anyone does, it will be an amazing experience. Guaranteed. And if I am alone, I will have a great time regardless. It is unlikely many people would show up for a birding lesson anyway given we will be in the midst of finals week, so I thought a walk would be less mentally strenuous than an actual lesson. Of course, I will share my knowledge and thoughts, but will not design a specific lesson plan. This will be a great way to close out my unit, with some peace and tranquility.

Personal Teaching Journal

Lesson #1(May 5, 2024):

I think my first lesson went very well and actually a lot like how I imagined it, which really set me off in a good direction for the rest of the unit. There were definitely some things I learned for the next lessons, but overall I was happy with how I taught it.

One thing it taught me was how many people and what types of people to expect at the lesson. Since I was advertising to UCSB Birding Club, I was not sure if I would have a lot of experienced birders or if most had joined the club to learn more. I found that I mostly had amateurs, and I had 5 students. This made it a manageable group where I felt I could really give individual time to each person and appeal to their learning needs. Most importantly, I could focus on the more timid students to try to really get that spark of interest out of them instead of just passing them by because they were not asking questions.

As far as my students meeting the objectives goes, it was obvious that they engaged with the material because of the amount of questions I had at the end. I wonder why they all rapid-fired questions at the end. Maybe because they were busy taking everything in at first, since it was most of their first times ever allocating time specifically for birding. For example, someone recalled me talking about orioles earlier in the lesson, and when I saw one flying over head they compared it to a kingbird they had seen and I was able to explain the difference using some new ideas and things I had mentioned earlier.

Since this lesson was a mix of structured teaching and discussions, sometimes I was not sure when exactly to have the group move on to the next thing. At times some people might just be standing around while others were looking at a specific bird, so I was not sure whether I should move the group along or let them keep looking. So next time, once we arrive to a new spot I will say, "ok we'll stop here to do (blank) for (blank) amount of time". And then when we are leaving I will say "ok we're gonna move on this way but if something is piquing your interest, feel free to stay back for a minute to keep looking".

The biggest thing I learned was how much structure I should implement and how much I should let the students lead the lesson. For my subsequent lessons, I will have a structure to build around, but if it does not actually go as planned that is fine. The main thing is to ensure the students are actively engaged in discussions and activities related to birds.

Lesson #2(May 19, 2024):

My second lesson was very different from my first. Unexpectedly, I only had two students. Since my audience was college students, this was a good thing to have prepared for. People have a lot going on, and waking up to go birding at 8:30 am on a Sunday is a hard thing for a lot of people to motivate for. So, this is something to account for in future lessons.

The lesson was centered around conducting a citizen science survey, so instead of having everyone couple up and go off on their own, the three of us established a sit-spot together. Because I intend to do another citizen science survey in lesson 4, this was actually helpful to learn from my mistakes. I realized I did not explain everything as well as I could have, so I had to explain some things during the actual survey. If students were all spread out, they could not have asked me questions and they would have probably struggled. Although, that is somewhat inevitable for anyone's first time conducting a bird count, especially when they do not really have much knowledge of the local birds to begin with.

In my Google Form assessment, it was clear my students learned what I was hoping. Beyond getting experience with a bird count, I wanted them to get familiar with bird calls. In response to my

question, “Is there a bird you can now ID based solely on its call?”, the student who in the first lesson had really liked the mourning dove said this: “I love mourning doves and now it makes me so happy when I am on the way to class in the morning and hear one calling from a wire or tree perch. It sounds like an especially chill, vibey owl. Like ‘hooh hooh hooh’, usually grouping the hooh’s in three”.

What this lesson taught me for the next one is that I should be more clear about what we will be doing for the lesson, explaining it at the beginning. One student suggested this because they like to be mentally prepared, which I very much understand. I thought I was creating some suspense but it is probably better they are ready to learn what I want them to learn and retain.

Lesson #3(May 26, 2024):

Luckily, my third lesson had the most students at 7, so there were a lot of questions to be asked and there was generally a very good atmosphere. This lesson was more similar to the first, where I had some mini activities and a lot of time was just allocated to working with each person to help them learn what they wanted to learn.

As an instructor, the hardest part(but also the coolest to see) was how social the group was. They were all constantly engaged in group-wide conversations, which was so great because it really brought the energy up. However, the conversations were not always about birding so I had to keep the group on track. As a college student teaching other college students, it was definitely disheartening to have to interrupt a conversation between new friends, but I had to in order to get through the points of my lesson.

Nonetheless, it seems I was able to have them engage with birding and inspired some new birders. One student who I met for the first time at the lesson, but whom I have some mutual friends with, has apparently been “obsessed” with the Merlin ID app. Two of my friends have said they have seen him scrolling through bird families on the app in classes. And, based on his responses to my google form, it seems like he has been noticing tons of birds on his way to class and in his yard.

Lesson #4(June 2, 2024):

My fourth and final structured lesson was in a completely different location, at coal oil point where we headed down to the beach from there to focus on identifying shorebirds. This lesson had even more students than lesson #3 with 12 people, which was super fun and cool to see new faces, almost all being new to birding.

One big challenge that I did not foresee in this lesson was the noise of the waves. Since the tide was pretty high, they were crashing hard so I had to take special care to amplify my voice. The waves compiled with the group size made it hard to address the entire group. There were at least three pairs of friends who came and did not know anybody else, so they were occasionally a little far from the group having their own conversations. I did not want to yell or tell them to come closer since I am just a college student too, so I had to kind of let them do their own thing and let them listen to what they wanted to listen to. My best strategy for countering this problem was to talk directly with the individual pairs or other individuals throughout the lesson. I would show them things on Merlin or flip to the page of my field guide that had the bird we were looking at as one way to engage them on top of asking them educational questions.

Final Reflection Paper

With my birding unit complete, I look back on my time each Sunday at 8:30 in the morning with genuine positivity and appreciation for everything that allowed it to culminate into a successful educational unit. I first conjured the thought of doing this lesson after a particularly enjoyable ES 127A class when we listened to Dan Fontaine tell us a story and show the techniques he used to engage his audience, and then had us split into groups to tell our own stories. I remember biking away from lagoon island, past Manzanita village, thinking I really want to keep birding and spread it to more people so I have people to do it. Somehow, the idea to advertise it to the UCSB Birding Club popped into my head. It was just a passing thought, but I kept being reminded of my desire to improve my educational skills when I went back to lagoon island for class each week. After wavering for the rest of the quarter, I finally committed and I am grateful I did.

I am also grateful for the positivity from everyone involved in the lessons. First of all, Professor Lewin and the other students in the class were extremely supportive of my ideas and seemed genuinely excited when I shared how my first lesson went. And the students I had, although almost always coming at 8:30 and making some sort of comment about it being too early for this, were engaged and always finished the lesson clearly more uplifted than they would have been otherwise. With the amount of engagement and support, I learned so much more throughout the unit than I expected, about education, birds, myself, and even graphic design and communication.

The main thing I learned from the first lesson that I could apply to the rest of my lesson was how exactly to design the structure. In my lesson plan write-up, it states that I was picturing an informal and unstructured setting, essentially having talking points that would naturally come up and give me a chance to talk and teach. The actual result was a bit different. As the lesson moved along, I saw it more beneficial to choose three different locations to stop, doing an activity at each one.

The first stop was at a barn where I knew there to be some basic birds like house finches and california towhees. Here I asked everyone to take just a few minutes to look around for a bird,

and then come together to tell the group what they saw so that we could all work together to identify what they had seen. Something that majorly helped in this activity was that Professor Lewin had some brochures that showed about 15 common birds that exist in the Santa Barbara area. I was able to give one to each student, which allowed them to use the resource to ID birds on their own rather than me having to tell them what it was. I learned that this was a really good way to help students really hammer it into their head what the various species were called. If I had just told them, most learning types would quickly forget. The second stop was in a small forested area where we were able to see some birds really close up which got my students excited. We saw a scrub jay and a mourning dove only 5 meters from us sitting on the same branch, funny enough. One of my students, who came to almost every lesson, really identified with the mourning dove because of this situation. Beyond the practical skills I taught, it was important to me that I fostered a spiritual connection with nature for my students through birds. A deeper connection to nature through reverential experiences like seeing those two birds, speaks to the bigger picture of why environmental education is important.

While the more contemplative aspects of birding are important and probably the most fun for the majority of students, I felt it was also important to have some lessons incorporating the scientific method. This led to my next lesson on citizen science. The main idea of this lesson was to first get comfortable discerning bird calls from the cacophony of the forest full of birds. This skill would be applied to a stationary bird count where we would count every bird we saw and heard in a 50 meter radius.

While I was disappointed to only have two students, this was actually an influential learning experience that I could apply to the rest of my lessons. The first lesson served as a starting point to see what the whole thing would be like. But this second lesson allowed me to practice focusing on my students, rather than the material. I could learn what types of learners my two students were and then analyze how environmental education principles could apply (ie. Tbilisi Declaration Objectives). While I had all the components of Tbilisi in my lessons, I realized I could further stress them and structure the lesson to effectively utilize them with specific intents. For example, I had my students

explain to each other how their bird count was conducted to ensure they could effectively participate in a future count. I used their connection to birds through the peaceful method of listening to bird calls which undoubtedly got the right attitude out of them. As far as awareness, knowledge and skills, these were things that I obviously already worked into each lesson but I was reminded to focus on ensuring that every individual student demonstrated these practices.

My third lesson went back to a similar theme that my first lesson followed. Again, I planned a few points along the way to stop and give quick lecture-type talks and run some activities. One of the mini-lessons was on naming the parts of the bird. I used a whiteboard to visually show the parts on a bird I drew, then I erased it and had students fill in the blanks. After that, they separated for five minutes to find a bird and practice recalling the parts of birds by actually seeing them on a real bird. This way of teaching the parts of the bird should have helped all four learning types. Type 1's likely learned best by filling in the blanks. Type 2's probably just learned from seeing it on the whiteboard. Type 3's and 4's both learned best from applying what they learned to actual birds. One thing I thought was funny is how I helped one of my friends who came for the lesson, and is a very clear Type 4 learner, learn the parts of the bird. I know she constantly makes songs to memorize things, so I suggested she do that for the parts of a bird. She did not like that idea initially, not wanting to sing in front of everyone else. But, as she walked away for the activity, she was humming something, and I was sure I could make out her singing "rump... bill...tarsus...". When she came back she had a full song for it about a thrasher she saw.

Everything I learned from the first three lessons culminated into what I think was a great fourth lesson that accounted for all of the learning moments I had prior. This lesson was on the beach, where we identified shorebirds and conducted a beach bird count. The first highlight for me was meeting a man who goes to Coal Oil Point Reserve every Sunday morning to watch birds. When he asked me what birds we were saying, I said "well, pretty much just a lot of gulls right now". He then offered to talk about gulls a bit. Given how hard it is to identify gulls, I knew very little about how to distinguish between the species, but now have a better idea of what at least 4 different species look like because of that man. This was a great example of how lessons do not always go

quite as planned, but that it can be for the better. While we had less time for a full bird count, we learned something completely unexpected. He also pointed us to where we could look for some snowy plover chicks, which was a highlight for everyone when we found them.

My fifth and final lesson(although it will be more of just a walk than a lesson) will be a sunrise bird walk to celebrate the end of the quarter and a successful unit on birding. I am heavily advertising it because of how cool it would be to have a big group right at the crack of dawn. Plus, I know most people will just stop their alarms and go back to sleep, understandably. But this will pare down the crowd anyway, so only the most committed birders show up for a great morning.

Thinking back to when I first conjured up this idea to teach an entire unit on birding is pretty surreal. I hoped it would serve two purposes: I could practice my environmental education skills and I could have some friends to go birding with. But the whole thing serendipitously led to much more. Mainly, I was chosen to be the president of UCSB Birding Club in the 2024-25 year because of my initiative to teach this unit and commit to birding every week. As president, I will be able to continue practicing my education skills. This lesson was hopefully just the start to many more early mornings birding with friends and strangers, and learning lots more.

Participant Evaluations

Through the following link you will find a spreadsheet of the responses to my google forms for each week. These forms include all teacher evaluation and student assessment questions.

<https://docs.google.com/spreadsheets/d/1aWjxZpskZLwRzgCms1vxNdHFCUXFox6oENRqgmf3spg/edit?resourcekey#gid=1311276718>

Some highlights from the student assessment responses:

Since the lesson, have you noticed birds more as you move around in your daily life? Any fun observations to share?

- Yes, I did! While in the park I saw a blue and dark grey bird, it was one of the ones we saw on our walk. I couldn't quite remember the name in the moment but I believe it was a scrub jay.
- I feel like the rest of the day I was more inclined to hear bird calls as I went through my day.

Write a haiku about the bird you mentioned above.

- She wades with focus. The wind whips off her feathers. Calm Snowy Egret.
- Sounds of car alarms. Look and you'll only see trees. One bird that can be
- Red-tailed hawk soars high. Silent hunter of the skies. Eyes keen spirit free
- A bird looking bird. Chirps a familiar call. Perched on chain link fence

Part of birding is building awareness. It's about asking questions, not just IDing birds. Have you noticed something interesting about a bird's activity that prompted you to ask a question? What was the question?

- I was wondering why certain birds were seemingly attacking other birds, like swooping in on them. It makes me wonder if it stole the other bird's eggs or caused it to feel threatened.
- I saw a hummingbird sitting next to a house finch on a telephone wire. What were they doing together?

A List of Birds Seen Throughout the Unit

Red-tailed hawk
Mourning dove
Scrub jay
Bushtit
Acorn Woodpecker
Double-crested cormorant
Snowy egret
Cliff swallow
Northern rough-winged swallow
Song sparrow
Canada goose
Common yellowthroat
Mallard duck
House finch
Anna's hummingbird
American crow
Yellow warbler
Spotted towhee
House wren
Black phoebe
Western flycatcher
California towhee
Red-winged blackbird
California thrasher
Great egret
House sparrow
Brown pelican
Western gull
Heermann's gull
Turkey vulture
Snowy plover
Willet
Snowy egret
Killdeer