

Restorying the Landscape:  
An Arts-Based Approach to Restoring a Schoolyard Bird and Pollinator Habitat

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## **Introduction**

Because I believe that the climate crisis is the most urgent issue facing the next generation, I feel that schools have a critical role to play in reconstructing environmental attitudes and practices. For this reason, my research and applications throughout the CTL program have involved ways to encourage creative connections between children and nature during the school day. As such, my cognate project has taken the form of a study which demonstrates the use of arts-based environmental education (ABEE) practices as a model for interdisciplinary outdoor learning in a schoolyard bird and pollinator habitat garden. The project is designed to uncover stories in the landscape through the restoration of not only the wild species displaced by human disturbance, but of the creative and empathetic bond between children and nature. I am structuring the final reflection as a rough draft for an article for future publication.

## **Context**

“It’s not just the land that’s broken, but more importantly, our relationship to the land... we can’t meaningfully proceed with healing, with restoration, without “re-story-ation.” In other words, our relationship with the land cannot heal until we hear its stories. But who will tell them?

— Robin Wall Kimmerer

In my current work as the garden teacher at McNear Elementary School, one of my projects has been to work with students, teachers and community partners in the implementation of a bird and pollinator garden on the school campus. This garden which I will refer to as the

habitat garden, is an approximately 900 sq. feet area behind a set of portable classrooms. My role in the habitat garden has included working with students on designing, planting and tending native plants that benefit local wildlife. Kimmerer's words resonate with me and have led me to consider various levels of student engagement within the process of native plant restoration.

While I understand activities of planting and tending the habitat garden to be of enormous value to students, I was looking for a way to extend my pedagogy beyond teacher-directed activities to one that could develop a unique, student-centered connection to the place. My background as an artist and art educator led me to consider the relationship between one's kinesthetic, sensory and imaginative experience with a landscape. In addition, the pursuit of narrative in visual art has provided me with a conceptual framework for my own artwork. Thus, I have envisioned this project as a response to Kimmer's call for stories that demonstrate an eco-literate representation of the land, as well as an answer to her question. Who better to heal the land *and* tell its stories, than children?

### **Research Aims and Goals**

By engaging fourth grade students as co-researchers, the study aimed to generate and collect data in the form of drawings, writing and digital videos, in response to the question, **What stories does the landscape tell me?** It was important to me to conduct the research *with* students rather than *on* students in order to involve them most fully in the research. In keeping with the goals of participatory action research, I hope that the experience of having taken part in such a study will empower students to approach the natural world with creative curiosity and to continue to find and share their own stories in the landscape.

A secondary goal of this project has been to demonstrate a visual arts-based approach to outdoor environmental learning that encourages a creative dialogue between children and the local ecology in the hopes that my findings and conclusions will contribute to the establishment of best practices for meaningful outdoor ecological pedagogy.

### **Literature Review**

The disconnect between children and the natural environment has long been of concern to educators (Dewey, 1898; Sobel, 1996; Louv, 2006) and continues to widen as digital media become more central to childrens' learning and recreation. (Louv, 2006; Van Boeckel, 2013; Wiederhold, 2020; Velde et al., 2021). While there is a growing collection of evidence that connecting with natural ecosystems in outdoor settings improves children's emotional well-being and supports learning in the classroom (Fjortoft, 2004; Charles, 2009; Chawla, 2020), there is a lack of best practices for outdoor ecological learning.

The practice known as eco-art education (Inwood, 2018) or arts-based environmental education (Van Boeckel, 2013) can present a model for engaging children with the natural landscape. The interdisciplinary connection between art education and ecological learning draws on the eco art movement of the 1960s and 1970s which sought to deepen the social relevance of art pedagogy by engaging with environmental issues (Lankford, 1997; Jagodinsky, 2008; Inwood, 2018; Van Boeckel, 2013). Situated within this discipline, hereto referred to as arts-based environmental education, is the practice known as place-based education, which emphasizes the importance of learning about local ecosystems (Gruenewald, 2003, Graham, 2007; Blandy 1998), often through integrated arts-based projects.

Much of recent literature proves the efficacy of arts-based environmental education programs in establishing empathy and caring for the environment (Grey, 2015; Capra, 2005, Bertling, 2015). Additional overlaps exist between art education and environmental justice curricula (Bowers, 2002; Creel, 2005; Sommerville, 2013).

As the climate crisis continues, arts-based environmental education can contribute to a cultural shift away from the resource extraction/consumption model and contribute to a new land ethic (Capra, 2005 Orr, 1992, Graham 2007). Anderson (2012) proposes that as the traditional shapers of cultural attitudes, artists and by extension, art educators are well positioned to develop new metaphors which reflect the experience of all species in an interconnected system.

French phenomenologist Michel de Certeau (1984) aligns metaphors to spatial stories based on the Greek word for bus, *metaphorai*. As such, metaphors in the form of stories have the power to activate places and give them meaning. Visual images can reflect a dialogue between artist and landscape in which the landscape expresses a narrative (Woolery, 2016). Such an ability to perceive stories in the natural world can be further understood through the indigenous practice of reading the landscape like a “sacred text” (Sarris, 2022).

Another arts-based approach to reframing environmental attitudes can be found in the practice of drawing in the landscape, through which knowledge becomes embodied by the physical act of mark making (Sousanis, 2015; Woolery, 2016). A phenomenological outlook explains that knowledge is constructed through perception, as is illustrated by Cezanne’s statement that “the landscape speaks itself in me” (Ponty, 1945). Also of importance is the idea that perception is fluid, multidimensional, imaginative and fundamental to cognition (Van Boeckel, 2013; Ponty, 1945; Sousanis, 2015). Van Boeckel (2013) describes art as our “antennae to the world,” through the “skillful and heartfelt use of the senses to articulate the full range of

one's experience of the environment" (p.68) which extends to both metaphorical and literal knowing. This project seeks to establish a dialogue between the students and the landscape, wherein visual perception expands into multiple ways of understanding, allowing the students to generate metaphors in the form of multi-modal narratives.

### **Research Methodology**

This project is an arts-based participatory action study of children's creative connection to a bird and pollinator garden on their school grounds. As co-researchers, fourth grade students were engaged as "story-trackers" to gather data in the form of drawings and paintings related to plants and animals in the garden. Narrative elements from local indigenous mythology were presented to students as a conceptual basis for creating imagery. Students then synthesized the images into multi-modal narratives which include drawings, writing and stop-motion animated videos which were uploaded to informational signage in the garden. In this way the students "planted" their stories for growth and propagation.

#### Participants

54 fourth-grade students participated in the study as part of their regular bi-monthly garden classes which are taught by myself, attended by their classroom teachers.

#### Data Collection Procedures: Arts Based Research

Because the children's artworks are the primary data collected, an arts-based research design is appropriate for this study because it allows the researcher to access information that is

unmeasurable by more traditional quantitative or even qualitative forms of research (Eisner, 1997; Levy, 2017). While traditional research processes lean toward the empirical and general, ABR and brings forth that which is non observable and idiosyncratic (Eisner, 1981) as well as that which is imagined or transcends the limits of language and measurement (Muir, 2020). Artworks can be considered the primary data source, as in this study, or can complement conventional research methods for mixed method approaches (Muir, 2020; Levy, 2017).

This study uses an arts-based participatory action research methodology. Participatory action research operates from the assertion that those most affected by a social issue should be key players in any research process that seeks to understand the issue. Arts-based participatory action research presents opportunities for the co-construction of knowledge in underrepresented communities (such as children) and can provide insight through artworks which express a variety of perceptions, emotions and cultural values (Rathwell and Armitage, 2016; Ayala, 2016; Jokela, et al., 2015; Lopez et al., 2018).

In order to learn more about procedures for arts-based data collection, I participated in a 6 week training course with Dr Leanne Woolery in Arts Based Perceptual Ecology (ABPE) in the Fall of 2022. ABPE is a research methodology developed by Dr. Woolery for studying environmental issues and is well suited to this study. She described ABPE as the process of collecting data through visual imagery and mark making in response to direct experiences in the landscape, apart from any preconceptions of what the finished product will be. In this way the researcher is the instrument and the data reflects the researcher's sensory experience. Through this process, a language of place can be developed which documents the stories of the land (Woolery 2021).

The research protocols demonstrated by Dr Woolery provide a framework for seeing more than what is simply visible, by connecting what is seen to what is perceived on a subconscious, intuitive, imaginative level. For the first phase or data collection, I used the ABPE protocol, graphic facsimile which Woolery describes as a kinesthetic and sensory exchange experienced between artist and landscape (1998). I reworded the protocol in age appropriate language as using all the senses to receive the landscape's story with no preconceptions. I also relayed Woolery's instruction to mirror the movements of the landscape with lines, using black felt tip pens for the first two protocols.

#### Pre activities - ways of knowing place

A unit on "rewilding" preceded the study where students participated in seeding wild grasses to extend the habitat area around the existing shrubs and small trees added in previous years. I introduced students to what I consider the three primary practices of rewilding: introduction of native plants, removal of invasive plants and collecting data through observation. Other preliminary arts-based data collection protocols included diagramming the garden, sound mapping, and recording weather observations through paintings. All data was collected in the students' nature journals which they have been using all year. These activities were important for developing observational skills and laid the groundwork for the current phase of the study which took place from March 14 -May 23rd 2023.

#### Data Collection Procedures

Two classes of fourth-grade students participated in the study as part of their regular, bi-monthly garden classes which are taught by me and attended by their classroom teachers. In



field journals, students created observational drawings that depicted the garden flora and fauna as story elements; characters, setting, action and sounds. These were developed by students into narrative drawings and stop motion animations which are displayed on a school-approved website linked to the signage in the garden. The project, as described above, was the curriculum presented to all students, whether or not they chose to have their artwork reproduced and included with research analysis.

### Protocols

Protocol/activity	Data Collected	Date	Materials, resources	Directions to Students
1. Introduction to study and stop motion app.		3/14	Slideshow (See Appendix 1) Ipads with Stop Motion Studio App	play with the app Try animating a simple object Get comfortable with the features available
2. ABPE Graphic Facsimile	Drawings Writing	4/13	Slideshow (See Appendix 2) Nature journals Black pens Stumps and coverboards in the garden Insect viewers	Directions to students: Use all your senses to listen to the landscape and catch the story. Draw 3 frames in nature journal; low medium high Observe 3 areas of the garden Find characters, setting and action This is a visual story -text is optional
3. Story development	Drawings Writing Sculptures	4/20	<i>How a Mountain Was Made</i> pps. Nature journals Ipad, app Claymation supplies: plasticine clay	Listen to the story of Question Crow and Answer Crow. Directed drawing activity in the classroom - crows and Coyote.

				Discuss using this as a story diagram or graphic organizer Continuation of drawing outdoors begin stopmotions
4. Stop motion	Videos in progress	4/25	Nature journals Ipad, app Claymation supplies: Plasticine, support wires, sculpting tools	Use StopMotionStudio to create video.
5. Trip to Fairfield Osborn Preserve	Drawings	5/4	Nature journals	Find more characters
6. View videos Stop motion development	Videos	5/9	Nature journals Ipad, app Claymation supplies	Discuss field trip compare/contrast FOP and the Habitat Garden View completed student work. Discuss technical tweaks frames/sec, adding voice Tech problems due to district updating all devices
7. Analysis of data				

### Analysis

The findings below have been generated by a preliminary analysis of all the data collected to date. The data consists of the student's artwork which includes drawings, writing and digital stop motion animations. I will refer to these multimodal sequential visual narratives as stories. Because the stories evolved and changed during the seven weeks of the study, I will also include single images which I will refer to as story fragments. In the coming weeks, when all data is collected, I will analyze the completed stories more deeply and identify thematic commonalities

in more depth.. Students will participate in an activity analyzing the finished stop motion videos during the last session of the project on **May 23, 2023** using Visual Thinking Strategies (Yennawine, 1998)

## **Findings**

Finding #1: Children can discover unique and original stories in a natural landscape through open-ended creative projects.

To revisit the research question: *What stories does the landscape tell me?* allows us to see the data as a reflection of the students' experience as they searched the habitat garden for story elements. This student-directed approach, a crucial element of the research design, yielded a diverse data set of unique and original stories. The data collection protocols were loosely structured and remained open ended with minimal teacher-directed tasks or predetermined outcome. In addition, the activities were designed to progress from directly observing (naming, sketching,) elements of the landscape to creating (planning, composing, inventing), narratives, and finally to evaluating (judging, comparing, critiquing) the finished stories. Providing multiple modes of expression (drawing, writing, sculpting and animation) gave students many avenues to respond to the research question uniquely and allowed the study to transcend the limitations of one or another process by generating many types of data. The digital element caused by far the most hindrances, due to the restrictions of the free version of Stop Motion Studio as well as the unpredictability of the Petaluma City Schools IT department which deleted the app and saved content through a system wide routine update.

This study was preceded by a pilot project (Appendix 4) which helped me develop the current methodology. This version of the study had another group of students move through a more specific and teacher directed project that I felt, ultimately alienated them from their own experience of the habitat garden. This caused me to reflect on ways to invite creativity into the activities by providing demonstrations and suggestions before stepping aside. I collected images to show the students in two introductory slide shows that I hoped would communicate various possibilities for responding to the research question. (See Appendix 1 and 2) The research question also evolved. Earlier versions; Can we find stories in the landscape and if so how; What stories does the landscape tell? The suggestions of committee members helped me narrow the question to appeal directly to the students and eliminate the degree of uncertainty.



*Figure 1. students looked for characters under stumps and coverboards.*

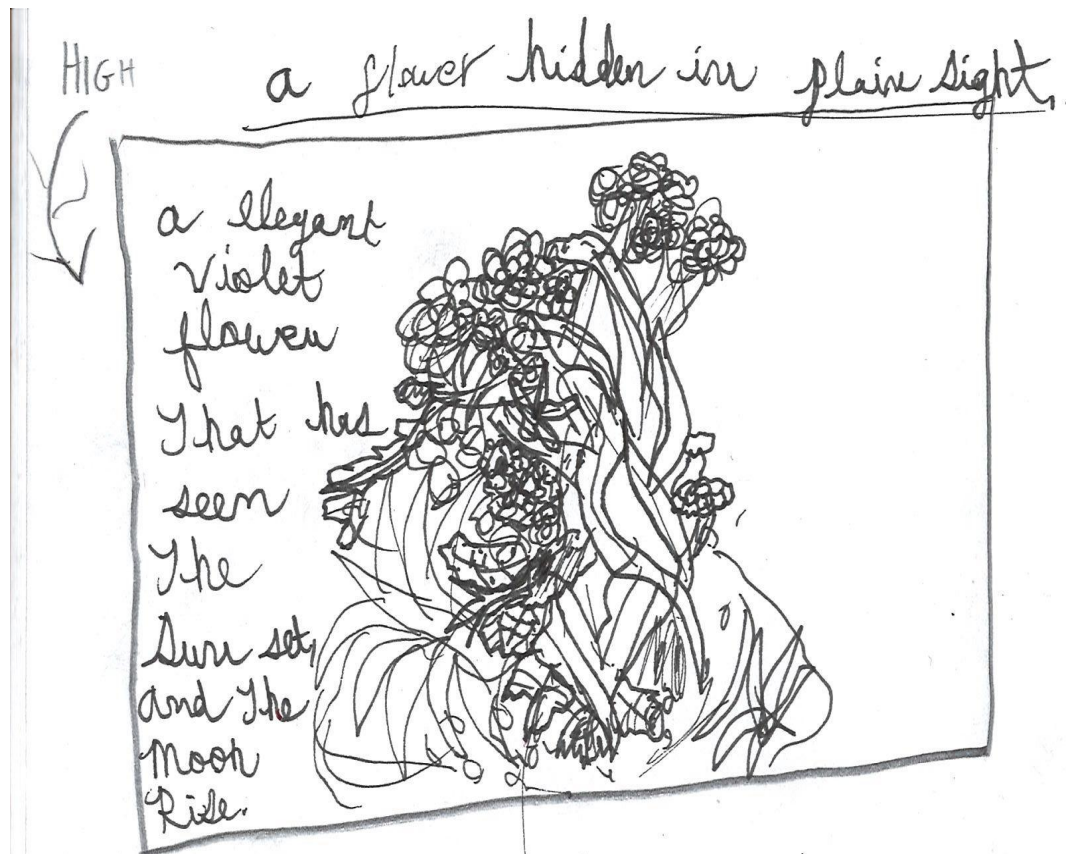


Figure 2. Students often moved fluidly between direct observation of the elements of the landscape to imaginative connection through character and plot development.

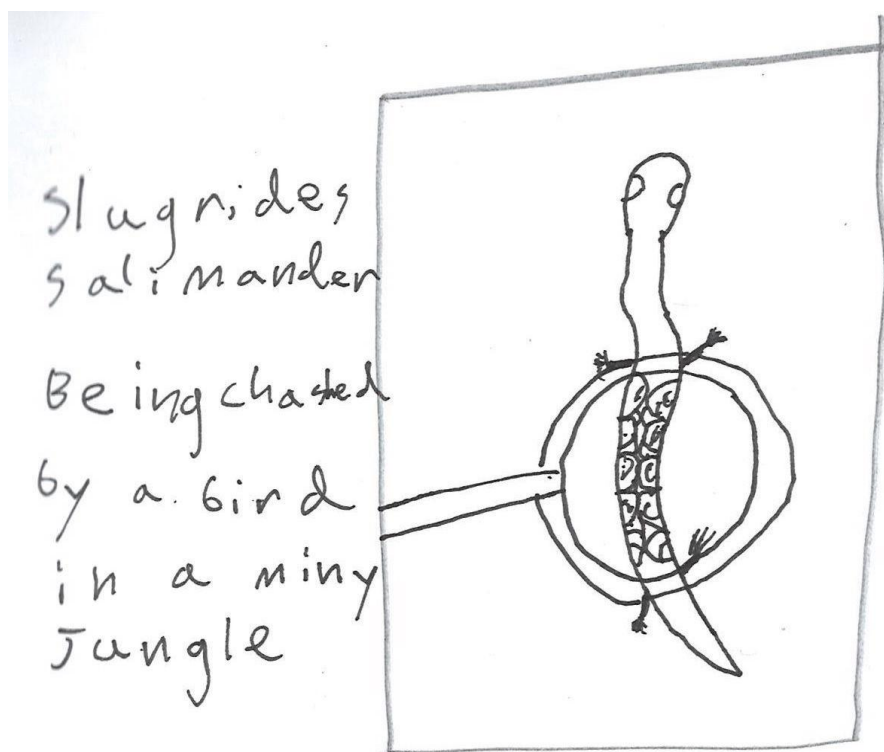
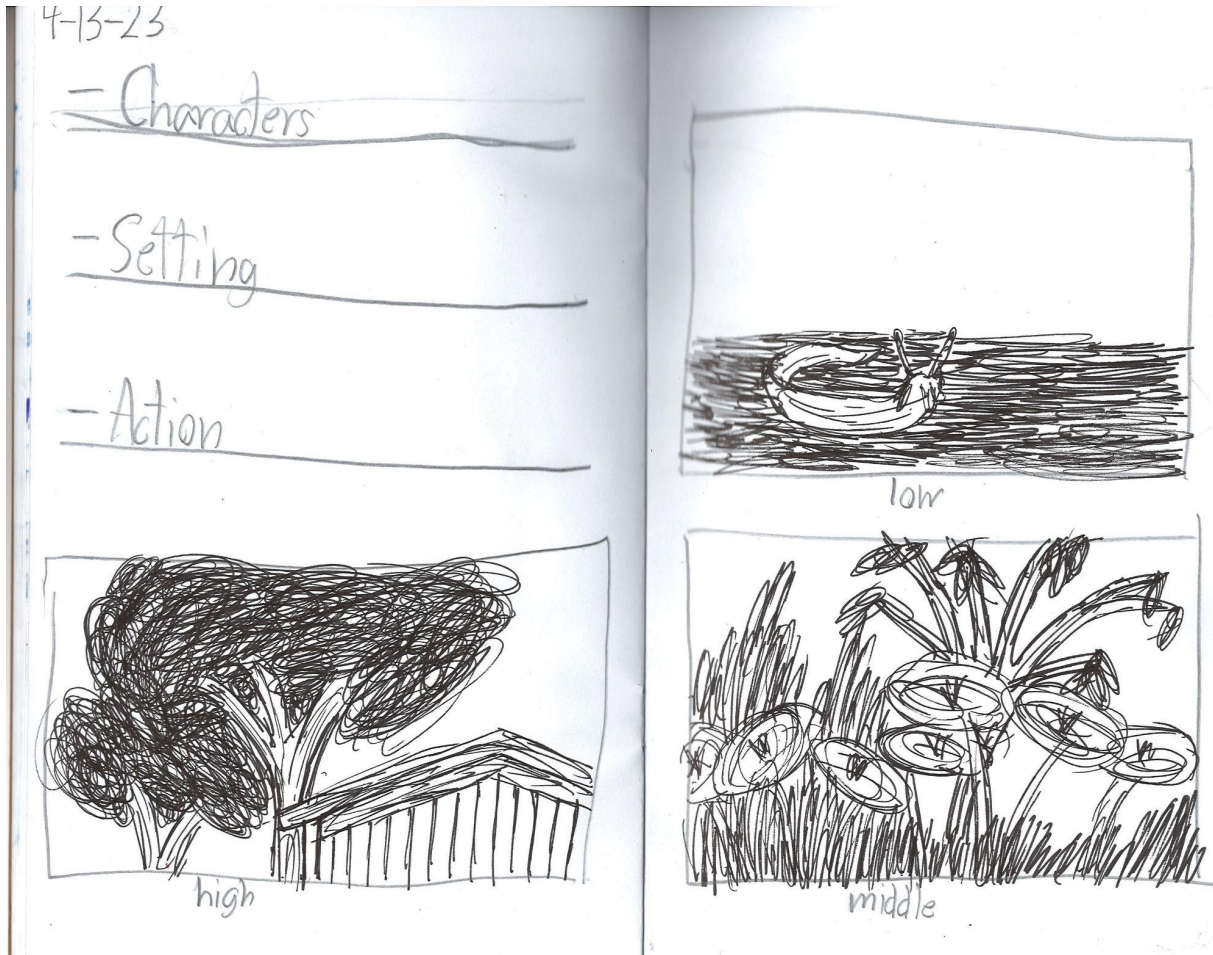


Fig. 3 These cognitive jumps were often made multimodally through an exchange between observing, drawing, writing and animating (see Figures 20-22)



*Figure 4. Many students found ways to tell their stories through detailed imagery.*



*Figure 5. The Stop Motion Studio App allowed students to tell their stories digitally by animating sculpted objects.*



*Figure 6. Plasticine modeling clay was used to develop drawings into three-dimensional figures and prepare for animation.*

Finding #2: Local indigenous stories connect children to places and provide an inquiry -based and imaginative framework for caring for the land.

Greg Sarris, the leader of the Federated Tribe of Graton Rancheria, writes of the Miwok tradition of “reading the landscape like a sacred text” where stories are perceived in every element of the landscape (2022). This is a foundational premise of the study and the data

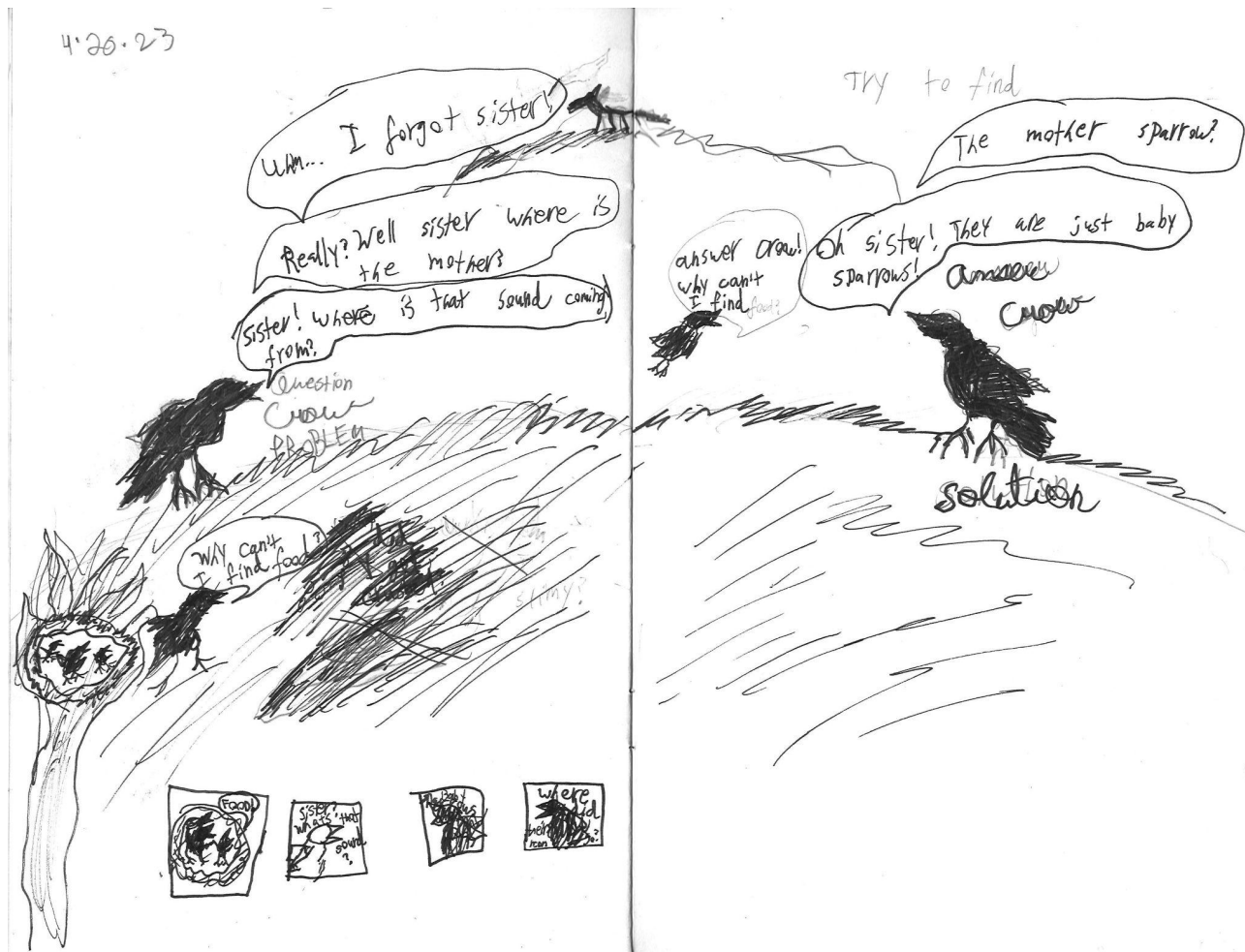
reflects how important a role local indigenous culture plays in providing a conceptual and practical understanding of place. Provided that the stories are shared respectfully and with the permission of the local tribes, they are valuable sources of information on how to see and care for the land.

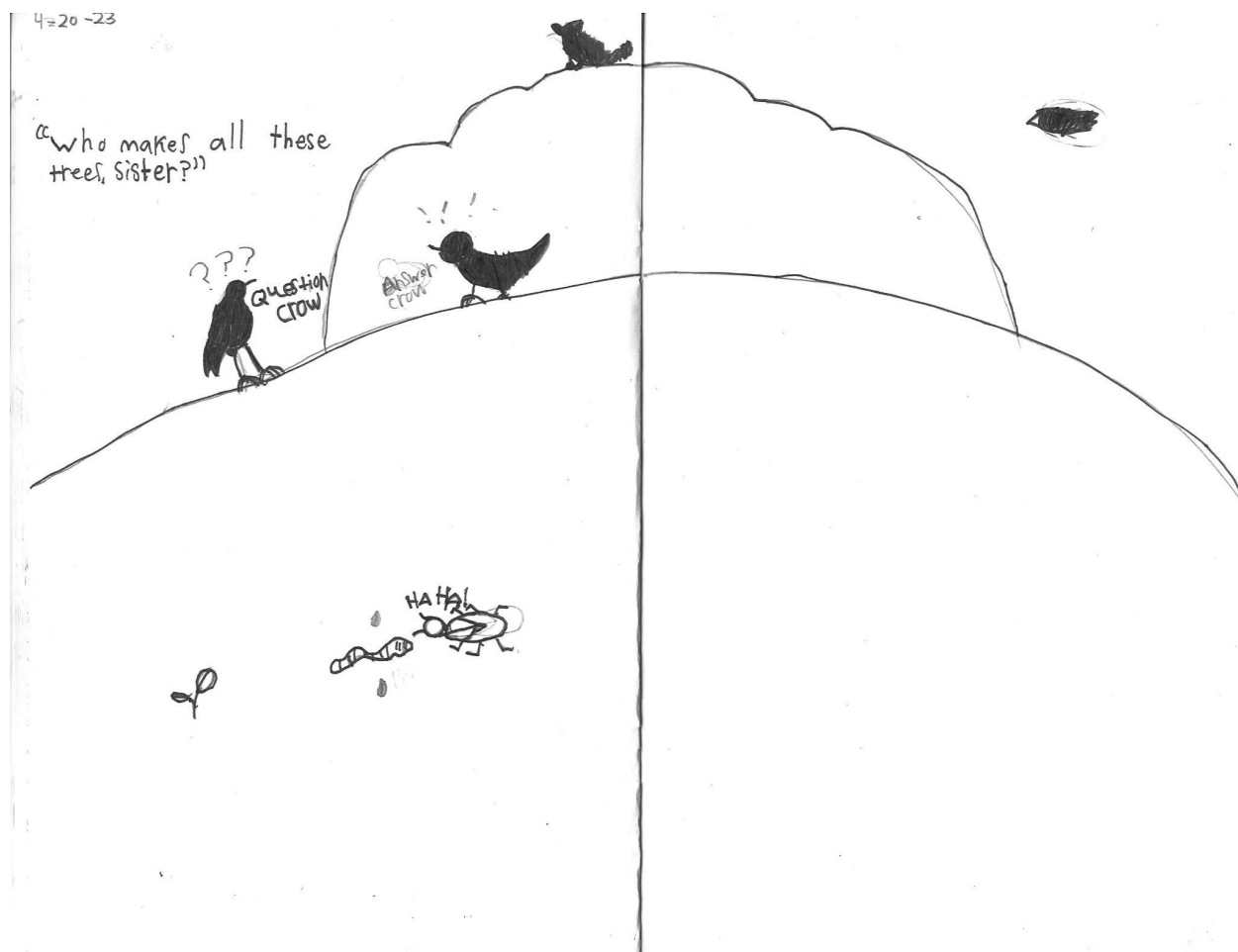
After hearing a reading of the crow sisters' conversation (Sarris, 2017), students were asked to draw the crows and their grandfather, Coyote, on Sonoma Mountain which is the ancestral homeland of the Coast Miwok. (Sarris, 2019) I found that Question and Answer Woman, whose exchanges frame the stories in *How a Mountain was Made*, helped the students diagram their stories by providing inquiry as a model for story development (figs 4 and 5). Additionally, Sarris' stories helped to link the plants and animals found in the habitat garden within the larger context of local geography and ecology.

Knowing that the crows told their stories perched on a fence by Gravity Hill, near the top of Sonoma Mountain, helped me prepare the students for a field trip to the Fairfield Osborn preserve on Sonoma Mountain which now occupies the site of the original Miwok village, described in the book by Sarris and is the site of the stories he tells. The trip was a planned element of the study and I participated as a newly trained naturalist, leading one of the groups on a hike along Copeland Creek. At the beginning of the trip, I told the students that they would have the opportunity to find and draw new characters for their stories as they looked under the rocks and coverboards at the preserve. This was also a powerful way to connect the habitat garden to the preserve and the greater Petaluma River watershed, as well as to extend the search for story elements. Through a subsequent class discussion, connections were made between our rewilding work in the habitat garden and the preserve as an example of how the land once was. To date, no new characters from the preserve have made it into the stories but some students



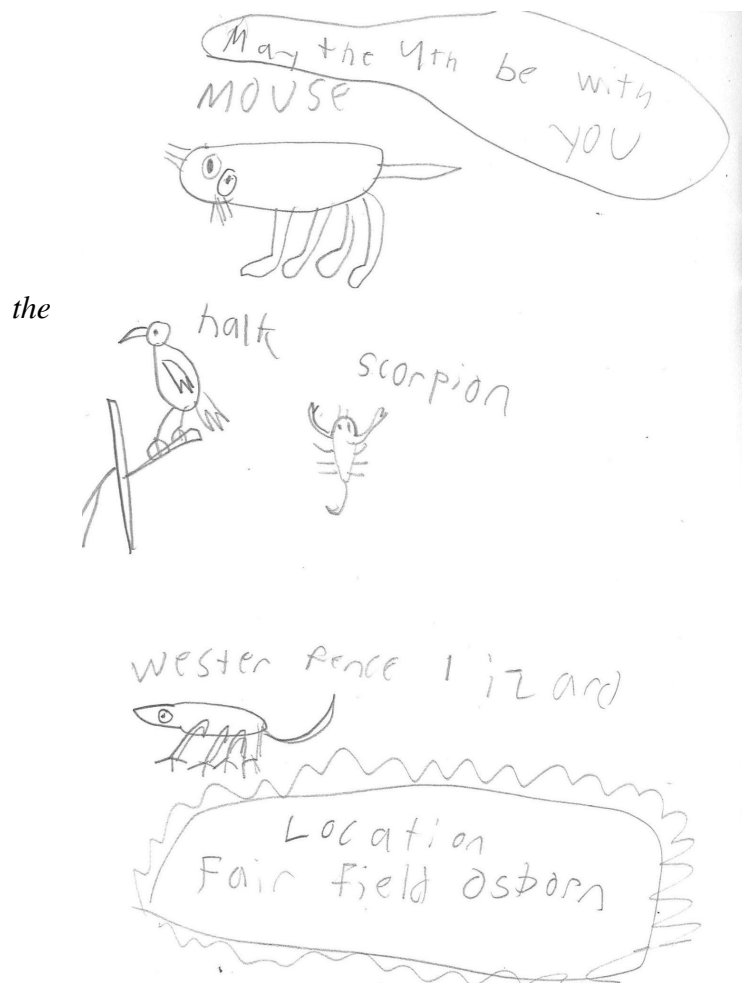
claimed to have seen Question Woman and Answer Woman as the school bus drove past Gravity Hill.





Figures 7 and 8

The two crows, *Question Woman* and *Answer Woman* from Greg Sarris' (2017) *How a Mountain was Made* provided an inquiry-based framework for story diagramming. This helped students conceptualize the characters and action observed in the habitat garden in terms of broader themes and concepts.



*Figures 9, 10, 11. A field trip to Fairfield Osborn Preserve helped students make connections between schoolyard habitat restoration project and the flora and fauna of Sonoma Mountain and added the possibility of new characters.*

Finding #3: Imagery from the children’s stories can be seen as metaphors that reflect reciprocal ecological relationships from the point of view of the children as well as the non-human inhabitants of the landscape.

In *Unflattening* (2015), Nick Sousanis describes stories as doorways or vehicles that “let us reach across time and space to share in another’s viewpoint (p.95).” Sousanis reflects Certeau’s (1946) idea of stories as metaphorical vehicles that give meaning to places. To this point, I find that the sample of stories demonstrates an understanding of the garden ecology from the point of view of the plants and animals with a very small percentage of human characters occurring. Preliminary analysis finds many stories reflect interdependence among characters as well as children’s life experiences such as friendship, aggression and bullying. As I continue to sift through the data, I expect more images to arise that will fulfill the many appeals for metaphor/stories to reflect a reciprocal relationship between humans and the land (Anderson, 2012; Kimmerer, 2014; Capra, 2013; Sarris, 2022).



The main antagonist



The Pincher bug

 The Pro antagonist

The worm

gives the

nutrients the

tree needs to grow.

The worm

struggles to

face his bully,

the pincher bug

Fig. 12, 13, 14 The worm appeared in many of the stories and displayed vulnerability, beneficence and spirit. The pincher bug was a common antagonist.

## Conclusions

Conclusion #1: Arts-based learning connects children to natural ecologies by offering opportunities for fluid, multimodal, imaginative and embodied cognition.

The primary conclusion of this study is that arts-based learning offers rich opportunities for children to form a creative connection with natural places. Because arts-based learning lends itself to multiple and simultaneous modes of expression, each student was able to develop their own unique narrative. Arts-based learning also facilitated an interdisciplinary experience that expanded prior knowledge of the habitat garden in many directions and dimensions. While more research is needed to understand the role of creativity in developing ecological literacy, I believe that making creative leaps from what is observed to what is imagined roots children to a natural ecosystem through their own unique consciousness.

Unpacking the data from this study has been a major undertaking and I am continuing to receive the stop motion videos sent from the students' ipads. One of the most interesting aspects is how the data collected so far reflects the thought processes of the students as they synthesize information taken from direct observation of natural phenomena to create a sequential, imaginative work of art. As mentioned earlier, the availability of various art materials and media produced a diverse range of stories told through drawing, writing and stop motion. While there was not enough time to create fully developed stop-motion videos, most of the children completed a short piece that reflected the story characters and ideas developed through the various activities. The following stories demonstrate this process.

How the Slug Got Slow



*click image for link to video*



*figures 14, 15, 16 How the Slug Got Slow*  
In this story, we see that Slug was one of the characters observed in the various levels of the habitat garden during the first activity. Next, the story is developed through inquiry when Question Woman asks “Sister, why is the slug so slow?” Answer Woman’s reply is shown by a drawing of an exchange between Slug and a new character, Centipede, indicated by a series of dots floating between characters. The student’s detailed story which they preferred not to write is expressed instead through sculpting and animating the characters as well as through the voice over narration.

## The One Tough Cookie



*click image for link to video*



**Fig.17, 18, 19 One Tough Cookie**

Here, the student conceived the story sequence during the observation process. The crow drops the acorn. The worm must battle the bully pincher bug in order to give the acorn the nutrients it needs to grow into a tree. An overarching question was developed in the second activity and the video remains true to the original story concept. Themes of interdependence and overcoming adversity are observed. The student also builds on previous knowledge to creatively extend their understanding of the life cycle of a tree.



The Big Bird



Click image for video link

4-13-23

- Characters
- setting
- action

where plot starts

high

miners lettuce and grass

middle

Sluggo the salamander  
Being chased by a bird  
in a tiny jungle

10W

4/10/23

Question crow

Answer crow

do you think he's chasing us?

LOOK AT THAT BIRD!

I guess he does

wait? why? let me tell you my friend...

Long ago there was a group of birds who ate different things and I ate nuts and I ate animal fat...

1 day the one who eats nuts so all birds leant to eat nuts because to eat bugs...

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long long ago there was a group of crows there were 3 in total each ate something different one ate leaves one ate bugs and the last one ate bugs one day...

the next day the one who ate leaves died because the leaves were not good. so from that day on no bird ate anything other than bugs

a crow who ate nuts died so the others leant not to eat nuts

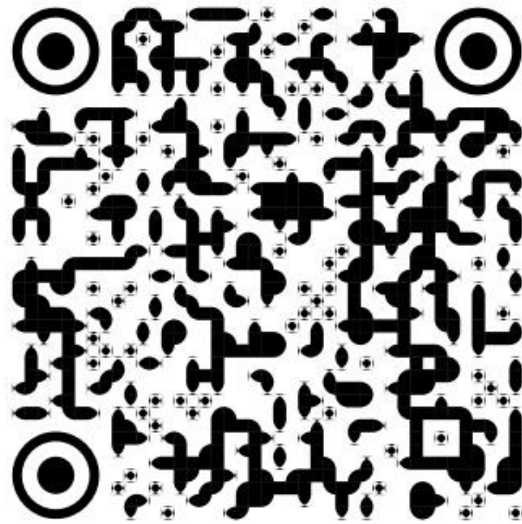
Figures 20, 21, 22 This story was inspired by a slender salamander found under one of the garden coverboards where a slug was also observed. The slug and the salamander work together to evade the pursuit of a crow, observed in the upper level of the garden. In the second activity, Question Woman and Answer Woman observe as the slug asks "why is he chasing us" to which the salamander responds with "Let me tell you my friend." What follows is a tale of why crows eat insects, which the student writes in detail on the following pages. The video returns to the original scene with the slug riding the salamander with the bird following from above.

Conclusion #2: Unused outdoor areas on school grounds provide an opportunity to restore habitats for wildlife as well as the connection between children and nature.

In the US, Public Schools own around 2 million acres of land.

(<https://www.tpl.org/community-schoolyards-report-2021>). As wildlife populations decline and children spend less time outdoors, it is imperative that schools provide opportunities for outdoor ecological learning on their grounds. The benefits to children and local wildlife are profound and regardless of the scale, schoolyard native plant restoration projects allow a plethora of ways to connect students to local ecologies. The word ecology, whose root is ecos, Greek for home, implies that the study of natural systems begins in our immediate locality, in fact as soon as we walk outside of our house or school. Field trips to nearby parks and nature preserves can help students contextualize the school campus as part of a wider ecosystem, but can not replace the immediacy of on-campus habitat restoration projects that can be integrated into the school curriculum through regular care and tending.

This study has illustrated how an arts-based curriculum can facilitate outdoor learning on school grounds. The pilot phase of the project included the creation of a mosaiced guide post with a qr code linking to the student's stories. This allows the stories to be experienced as part of the garden. In this way the stories will live on to hopefully inspire new stories and new metaphors that encourage connection with and care for the land.



**SCAN ME**

*Figures 23, 24, 25 Stories are linked to a qr code on signage in the garden.*

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**Appendix 1**

Slideshow #1: Stop Motion Animation

<https://static1.squarespace.com/static/52084a4ae4b0cc1763c4cf17/t/644efa918c5c6e5b7674ccaf/1682897553842/Stop+Motion+Animation+%281%29.pdf>

**Appendix 2**

Slideshow# 2: What Story Does the Landscape Tell You?

<https://static1.squarespace.com/static/52084a4ae4b0cc1763c4cf17/t/644efa8680c9c90dcf651ee3/1682897543659/Slideshow+for+4-13+%281%29.pdf>

**Appendix 3**

Project Proposal

<https://learninginthelandscape.com/cognateproposal>

**Appendix 4**

Pilot Project Proposal

<https://static1.squarespace.com/static/52084a4ae4b0cc1763c4cf17/t/63e96289d7c91b25267bc476/1676239510989/McNear+Habitat+Garden+Upgrade++%283%29.pdf>