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Point Blue Conservation Science STRAW Project 2023-2024 Report

Task 1: Marin County Education

Sub-Task 1: In person lessons

Table 1.1 STRAW Marin Countywide Metrics

School	Grade	Total Students	Total Teachers	Total Volunteers/ Chaperones
Bahia Vista Elementary School	4th	77	3	17
Bahia Vista Elementary School	5th	97	4	16
Bolinas-Stinson Elementary	6th 7th 8th	32	2	3
Edna Maguire Elementary School	5th	67	3	20
Glenwood Elementary	3rd	42	2	12
Glenwood Elementary	4th	55	2	0
Hidden Valley Elementary	5th	52	2	18
Loma Verde Elementary School	1st	68	3	18
Loma Verde Elementary School	2nd 3rd	72	3	24
Loma Verde Elementary School	4th	75	3	18
Loma Verde Elementary School	4th - 5th	62	3	11
Lynwood Elementary School	1st	49	2	10
Lynwood Elementary School	3rd	46	2	5

Miller Creek Middle School	6th	204	2	0
Miller Creek Middle School	7th	178	2	2
Miller Creek Middle School	8th	210	2	0
Olive Elementary School	Kinder	55	3	14
Olive Elementary School	5th	30	1	7
Olive Elementary School	3rd	24	1	6
Olive Elementary School	4th	28	1	5
Ross Elementary School	7th	33	1	7
(Marin) Hidden Valley Elementary	5th	52	2	14
Novato Charter	3rd	29	1	7
Pleasant Valley Elementary	4th	77	3	10
Tomaes High	10th 11th	24	3	0
TOTALS		1738	56	244

Table 1.2 Marin STRAW Wide Metrics

Total plants: 10,405
Total Schools: 14
Total Students: 1738
Total Volunteers and teachers: 300

Marin STRAW-Wide Metrics ~ 2023 - 2024	
Total Students	1738
Restoration Days (with Schools)	34

Unique Schools	14
Total Plants	10,405
Total schools	14
Total volunteers	244
Total teachers	56

Sub- Task 2: Curriculum Updates

Preparation for our Multi Visit Program (MVP) started early in the Fall 2023. Project managers and restoration technicians contacted teachers in order to start scheduling restoration dates and our educational visits during winter 2023. This was my first approach reaching out to teachers and introducing new members of the STRAW program and excited to continue the inspiring work started 30 years ago. Teachers were open to welcome a new education team to visit their school and get to know the intimacy of their classrooms. Each classroom had a different feeling, and was unique and special. And each one of them welcomed the team, eager to learn and share the new knowledge they were learning about conservation and restoration efforts with each other.

STRAW educators had the opportunity to work closely with two STRAW apprentices. Eri Sawairi, Bilingual Spanish-English Conservator Educator collaborated with two STRAW apprentices: Jacky Krisalis and Jordan Dixon. Both of them are young, fascinating professionals, who embarked on a conservation journey and had the opportunity to co-lead and teach our five lessons together. Delivering 15 lessons total for three 4th grade classes.

Edgar Alvarez, Bilingual Spanish-English Conservation Educator, collaborated with two STRAW apprentices: Veronica Wade-Lewis and Aidan Cox. As a team, they visited Bahia Vista five times and taught 20 lessons altogether for 5th grade, pre and post lessons. The lessons covered topics such as:

What is a watershed? What are the parts of a watershed? What is a tidal wetland? To whom are tidal wetlands important and why? How are we connected through this? What species rely on this ecosystem?

The students at Bahia Vista gained an understanding of watershed and tidal wetland functions and applied the classroom knowledge through a hands-on restoration day with their class. In doing so, this encourages students to develop a sense of community responsibility and stewardship. Notable highlights were the enthusiasm the students had when presented with the opportunity to continue working with STRAW to improve their community.

The team collaborated in reviewing the four pre-restoration lessons for three 4th grade classes. The schedule was for 3 lessons during the month of February, and 2 in March. Total of 5 lessons were delivered with topics about STRAW, watersheds, structure and functions of a wetland, and how restoration helps wetlands ecosystems.

We worked together as a team to review our STRAW lessons plans, revise, update and accommodate our plan to our classes needs and collaborated with ideas on activities, dynamics, feedback and assessments.

We also worked under the guidance of the Education Manager, Celida Moran and Senior Education Manager, Gina Graziano, who shadowed some of our lessons and shared feedback and space for growth.

As we visited the classes, students remembered our names and anticipated learning new topics related to the previous lessons, making meaningful connections to their personal experiences. Students ended the program feeling more confident of their learning process and comfortable asking “scientific questions” based on their observation and formulating hypotheses to socio-scientific issues.

Students were interested in their nearby ecosystems and specifically about native species identification of plants and birds. Each week the team delivered a new lesson based on the 5E inquiry-focused model of instruction, placing the learners in the center and encouraging students to engage their curiosity to ask questions. This model provided a structure to students to connect science ideas with their experiences and apply their learning to new contexts.

Restoration projects were not a new subject for the MVP teachers at Bahia Vista Elementary School. The relationship has been strongly maintained for more than 12 years with some of the teachers. They are all local, involved people with their community. Mr. Shaffer has done restoration work with his younger students at Pickleweed Park. Ms. Koller's love for nature inspires her students to keep learning, and opens opportunities to have her classes experience the outdoors right here in the Bay area. Ms. Maldonado has a deep dedication to accommodate all needs and include every single student's learning and love for their ecosystems. All of the students and teachers felt deeply tied as a great community, with teachers promoting learning experiences for all their students, and students supporting each other, and together making change happen by taking care of our environment.

Student Assessments

Assessment of Students (*oral and written assessments were provided in both English and Spanish*):

- Pre and post oral or written assessments during restoration and conservation science lessons.
- Pre and post oral or written assessments during restoration days.
- Oral responses to questions at restoration days.
- STRAW's MVP students also completed end of program reflections and shared out with their peers.

We maintained our successful education plan that included different assessment approaches to understand students' learning, reflections, and questions to inform the lessons we provided to the students.

The specific assessment technique we used at the end of students' classroom lesson before their restoration day was to ask students to finish the following three phrases: "I know..., I feel..., I wonder..." This technique was a successful approach across a range of grades and provided valuable information to our educators. This information allowed our educators: to understand concrete themes students understood, the opportunity to clarify any misconceptions or questions students had, and to share this synthesized information with the students' teachers and restoration site project managers.

For restoration days, we began our restoration with an opening circle that served as a welcome, schedule and site orientation, and as an oral assessment of their classroom lesson by reviewing key themes to ensure a more meaningful day. Similarly, the end of the students restoration day concluded with a closing circle where we ask students to share what they hoped their restoration sites will look like next year, in 5 years and in 20 years; it is a space where students can share their hopes for their work and their highlights of their STRAW experience.

Our successful collaboration supports these young students to become responsible and informed community members. The reliable and consistent support from MCSTOPPP allows us to continue to expand and address the innate curiosity that many young Marin County residents have about their local environment and how they can help improve it.

Appendix

Appendix A: Sample lesson revised and implemented to incorporate MCSTOPPP outreach objectives, specifically about watersheds, and how storm drains carry trash and pollution to the bay

and local creeks. This lesson was taught by two STRAW educators with the support of two new STRAW apprentices to model STRAW's watershed education curriculum for entry level members of the team.

STRAW Multi-visit Program (MVP): Visit 1 Bahia Vista Elementary (1 out of 5)

Friday, February 2nd

- 9:20-10:10 Ms. Doving
- 10:10-11:00 Ms. Brand
- 11:00-11:50 Mr. Littée
- 12:10-1:35 Ms. Tran

Friday, February 2nd

- 10:15 - 11:15 Ms. Maldonado
 - Spanish-speakers: three students need support and one student needs translation.
- 12:00 - 12:50 Ms. Koller
 - Spanish-speakers: one student needs a translation.
- 1:20 - 2:20 Mr. Schafer

Enduring Understanding:

- Students will understand what a watershed is and that they will make a difference through our work together.

Essential Question(s):

- What is STRAW and what is my role within the program?
- What is a watershed?

Students will know:

- The story of STRAW and how it began
- That they will make a difference through this program
- Students will understand that they are part of our STRAW community, and have something unique to offer our community
- That storm drains are part of a watershed and lead to local creeks and rivers

Students will be able to:

- Define what a watershed is: anywhere water is collected, stored, or drained.

Learning Plan

Engage: (8 min) (Educators + Apprentices)

- Write your name with a marker on the name tag if they don't already have name tags on/ tape we pass out and then join me in a toe-to-toe circle/ stay in desks if that seems better in the classroom.
- “Hello! I’m _____ from STRAW. These are my friends _____ who are also from STRAW at Point Blue Conservation Science. You may have heard we are going on a field trip in a couple of weeks to plant plants and that we get to visit your classroom a few times- today we are going to learn about watersheds! Our plan for our time together today is to learn about what a watershed is.
- First, I have a question for you all! I’m wondering if anyone knows what a watershed is? If you don’t know, that’s okay” Well, I have a challenge for you!

Explore: (7 min) (Educators + Apprentices)

- Show students a [photo of a shrimp](#) and tell them you have a story for them. Share the story of STRAW in the most exciting way, emphasizing that students created the project. At the end of the story, mention that our name changed from the Shrimp Club to STRAW.
- Write “STRAW” on a field white board and ask students what those letters stand for. When they get to the W ask them to share their hypothesis for what a watershed is with someone next to them and then ask for a few volunteers to share with the whole group.

Explain: (10 min) (Educators + Apprentices)

- *When you get to the “W” in STRAW, ask students to do a think-pair-share.*
- Now we are back to that word, watershed! Take 48 seconds with your elbow partner and share your best guess of what a watershed is.
- *Invite students (aka “brave scientists”) to share with a quiet hand: What is a watershed?*
 - *Affirm students for being brave and sharing but help them create an accurate definition of what a watershed is by affirming correct answers and redirecting incorrect ones (i.e. “not quite- remember it's not something humans have created...”)*
- Direct Instruction: Tell students that a watershed is anywhere where water is collected, stored, or drains.
- *Give directions for going outside to really explore what a watershed is. Have students leave all materials in the classroom and tell them we will make a toe-to-toe circle when we go outside.*
- Outside: Ask students to look around, do they see any hills, mountains, taller parts of their school yard? When it rains, where does that water go? (2-3 volunteers share out)
 - Water “sheds” off the mountains
 - Look around, do you see a storm drain?
 - Show a laminated photo of a storm drain- where does water go that goes into this storm drain? To local creeks and rivers.
 - Storm drains- where do the storm drains go? Storm drains are part of the watershed.
 - All water eventually flows to a stream or lake and ends up in the ocean.

- Show laminated photo of a watershed
- Watershed dance- mountain, rivers, wetland, open bay, ocean (La cuenca de agua - Empieza en las montañas, fluye hacia río, luego a la bahía, y al final va al mar)
- No matter where on Earth you go, you're always in a watershed!

Elaborate: (12 minutes) (Educators + Apprentices)

- With materials right here in this schoolyard (*give 4 corners parameters to stay within*), you have 5 minutes to build what you think a healthy watershed would look like. (*Decide or ask the teacher if you want students to work in pairs, groups of 3 or 4*). The goal is to create a mini-version or a model that represents a healthy watershed. You will collect:
 1. Five to ten items, such as rocks, leaves, twigs
 2. No items that are alive, such as a large branch or parts of a bush (that is habitat for so many other critters!)
 3. And nothing that can hurt you, such as something sharp or a piece of trash that may have unhealthy germs.
- When I give the coyote call again, you must return to this circle for the next set of directions. After they are in a circle, ask them to share with the person next to them how they know they are being helpful to their team. I know I am helpful when I am listening to others, when I am sharing what I know, and when I respect others' space.
 1. (2 min + 5 min) They get into groups, and they begin to build their model.
- *Emphasize to students to include the five parts of the watershed.*
 1. *Optional: Guide students to start their models by deciding where the bay is first. Ask students where their school is in the watershed. Introduce different species they may be familiar with, such as crows, deer, rabbits and other birds.*
- *Another coyote calls, and then does a gallery walk in a line or in a wide circle.*

Evaluate: (8 minutes) - (Educators + Apprentices)

- Back inside the classroom
 - Review what a watershed is and why they are so important. Introduce to them that next time we meet we will be learning about what part of the watershed we will be visiting, the wetland!
- Have students complete the following sentence starters on the back of their pre-assessments (or just choose 1-2 sentences to complete if short on time):
 - I know...
 - I feel...
 - I wonder...

Materials:

- Learning Plan
- Name tags for students and STRAW teachers (envelope labels)
- Pre-assessments for all students
- Photo of California freshwater shrimp

- Photo of storm drain
- Photo of watershed

Appendix B: Quotes from students demonstrating their understanding and critical thinking after a Bahia Vista MVP lesson.

STRAW Multi-visit Program (MVP): Bahia Vista Elementary students' quotes:

4th Grade

- "Me gusta mucho esta clase y lo que aprendimos hoy" Ana Maria (Ms. Koller)
- "I wonder if something is camouflaged, could I see it or find it?" Edward (Mr. Shafer)
- "I wonder what other animals are endangered" Gael (Ms. Maldonado)
- "I wonder what we will learn next." Joshua B (Ms. Maldonado)
- "I know animals live in pickleweed and I feel happy to learn about wetlands" Odalys (Ms. Maldonado)
- "I feel like a scientist" Monce (Ms. Koller)
- "I wonder how animals were made" Jenni (Ms. Koller)
- "I wonder what the flowers are called, all the flowers in the world" Ashley (Ms. Koller)
- "I wonder what plants are made of" Melvin (Mr. Shafer)
- "I feel happy to come to learn" Daiana (Mr. Shafer)
- "I know diversity means different" " I feel smart" " I wonder what else lives in the mudflats" Emelys (Mr. Shafer)
- "I know that we are grateful to see the bay wetland' "I feel happy"
- "I wonder how water transform" Mayli (Mr. Shafer).

5th Grade

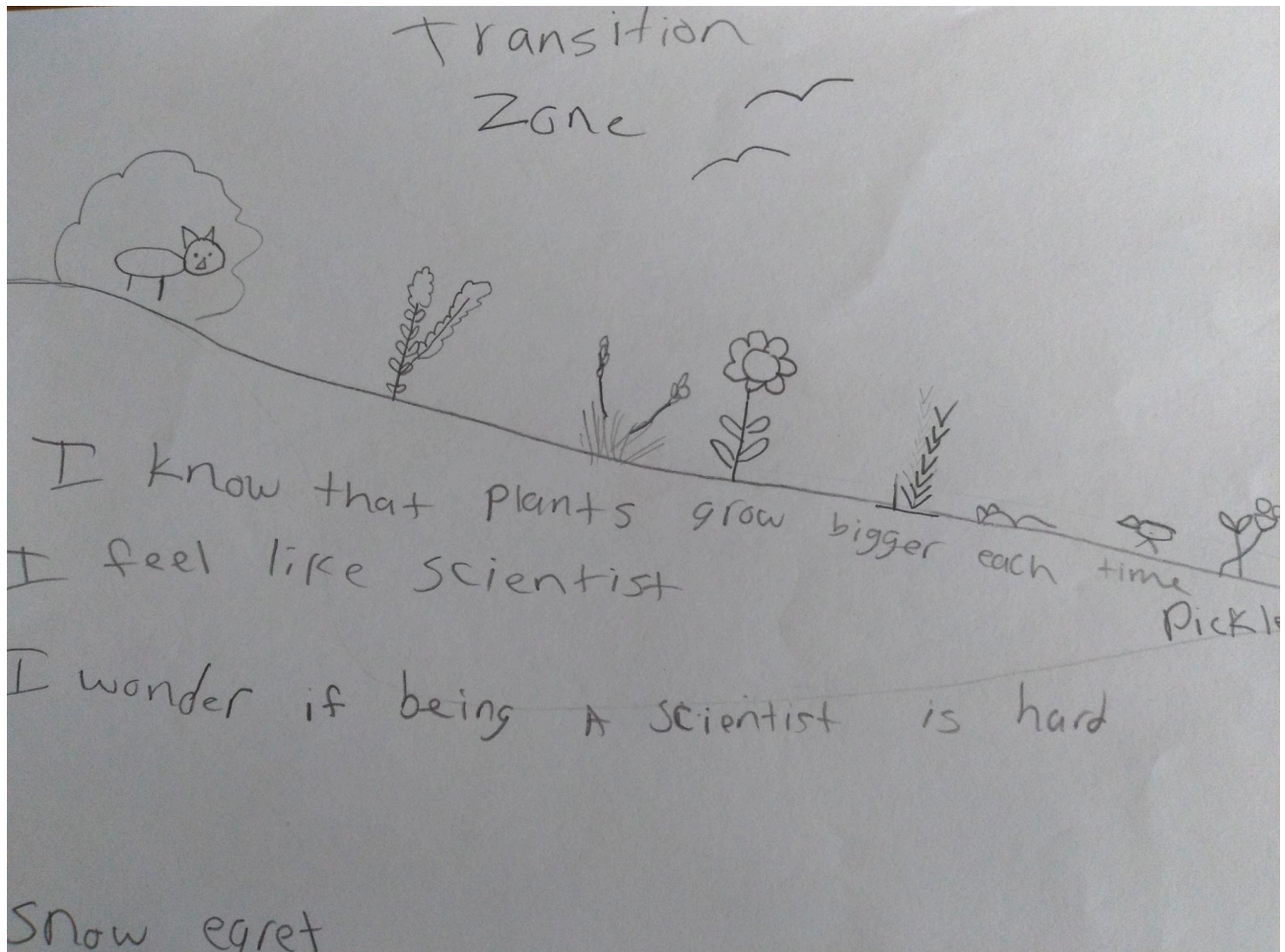
- "I feel happy because we are saving endangered animals"
- "I know that a watershed starts from a mountain, goes to a stream then a wetland then it goes to the bay and ends up in the ocean"
- "I know that we should help animals more"
- "I feel happy I am helping the earth"
- "I feel happy that I am learning about plants animals and the wetland"
- "I feel ex(c)ited to go to a fieldtrip about wetlands and to learn what can make a wetland or how a wetland works"
- "I feel relaxed when I am outside in front of the bay"
- "I feel happy that I am learning about animals and plants in the wetland"
- "I hope my restoration helps animals and plants thrive"
- "I hope our tidal marsh restoration work will (grow) many sticky monkey flowers"

Feedback from Bahia Vista Elementary Teachers:

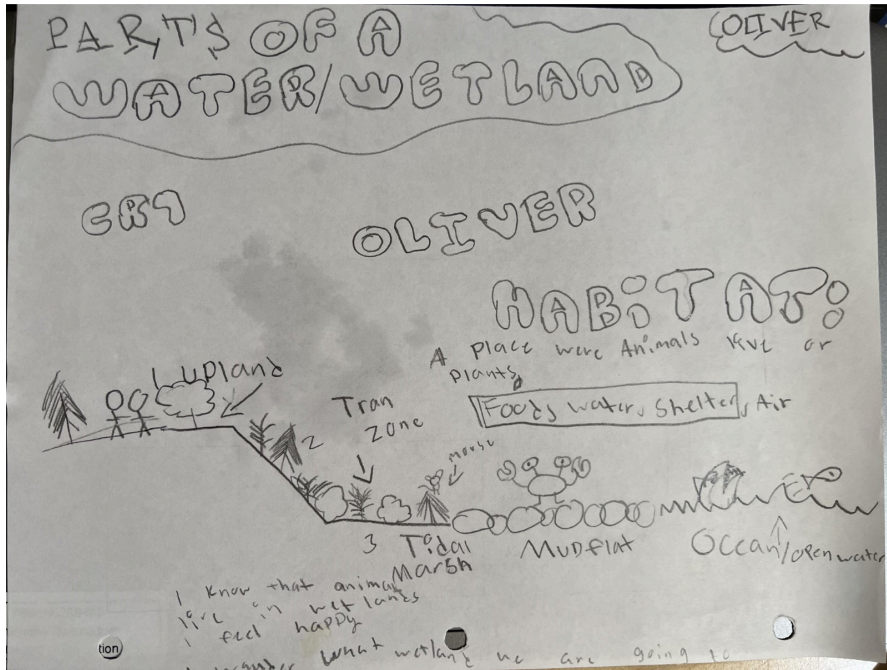
- “I love that the teachers/staff reviewed the content taught in the previous lessons and the games, movement/chants that were incorporated throughout the lessons. I also liked the use of visuals with the use of the slide show.”
- “I enjoyed that my students were thoroughly prepped with knowledge before the restoration day. In addition it was nice to have the follow through of the post restoration lessons. This program also allowed for my students to build relationships with adults they would be working with the day of the field trip.”

Appendix C: Photos

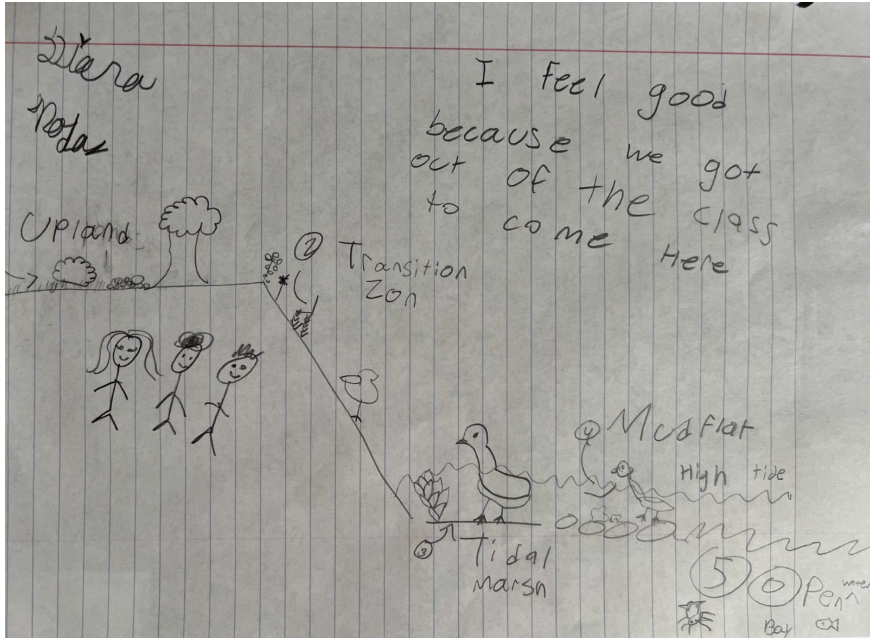
Photos from classroom assessments:



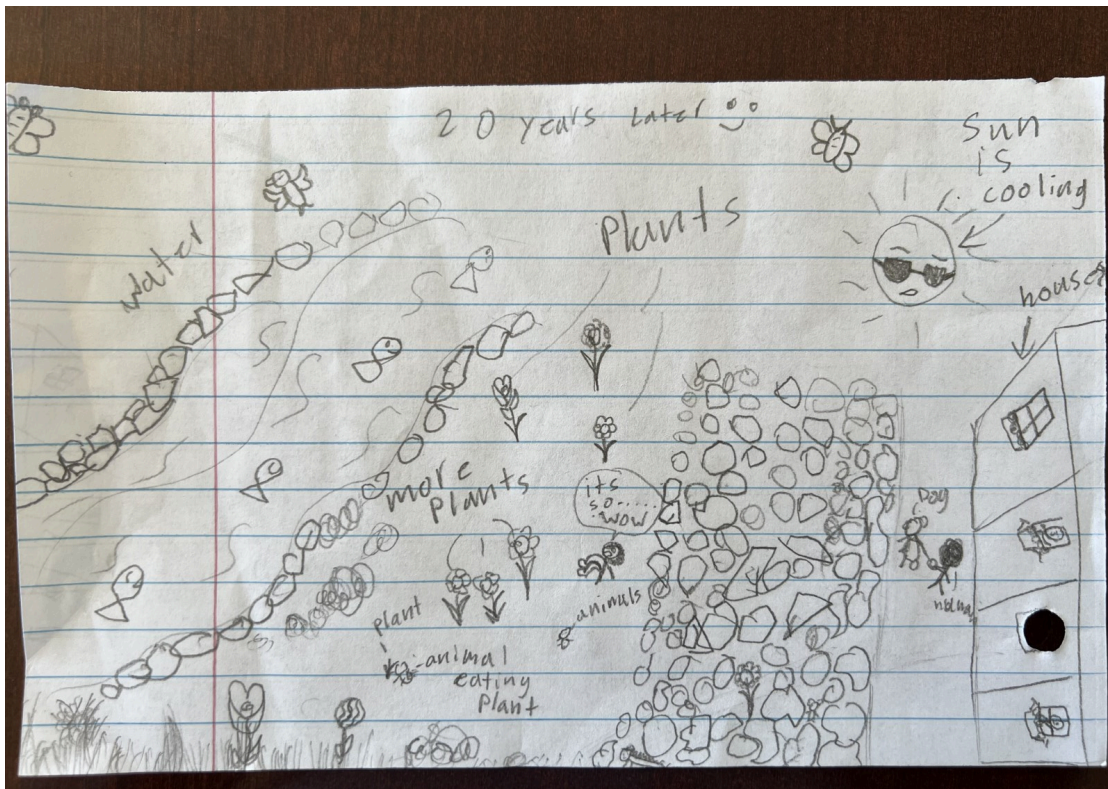
4th grade student assessment after a pre-restoration lesson at Bahia Vista.



5th grade student assessment of the various components of a tidal wetland.



4th grade student assessment displaying the different parts of a tidal wetland.



5th grade student assessment of what their restoration efforts will look like in 20 years.

Photos from Marin County restoration days:



Bahia Vista 4th grade students out at Hamilton Wetlands on their restoration day, March 5th, 2024.



STRAW Apprentice Jacky Krisilas helping 4th grade students from Ms. Maldonado's class with a "plant inspection" performing the palm test to ensure the plant is at the correct depth, March 5th, 2024..



5th grade students from Ms. Doving's and Ms. Brand's class prepping for their restoration by watching a plant demonstration by Dez (off white cap on left, facing the crowd) and Emily (brown cap on right, facing the crowd), overlooking the wetland, March 7th, 2024.



4th grade students from Mr. Schafer's class proudly posing with their California Wild Rose that they planted, on March 5th, 2024!



Alycia Matz (furthest left) and 5th grade students from Ms. Doving's and Ms. Brand's class at viewing murmurations during our STRAW Plant Demonstration, March 7th, 2024.



5th grade students from Mr. Litte's and Ms. Tran's class planting California Wild Rose on the transition zone, March 08, 2024.