Point Blue Conservation Science

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Point Blue Conservation Science STRAW Project

2022 Report

We thank MCSTOPPP for supporting Point Blue Conservation Science's Students and Teachers Restoring A Watershed (STRAW) Program. Below is a table listing all of the Marin County Schools during 2021-2022.

Site	School	Restoration Date	Total Students	Chaperones
Bahia East Peninsula	Bahia Vista Elementary School	2/3/2022	55	0
Bahia East Peninsula	Bahia Vista Elementary School	1/25/2022	26	1
Bahia East Peninsula	Bolinas-Stinson Elementary	1/12/2022	16	8
Bahia East Peninsula	Edna Maguire	3/22/2022	68	12
Bahia East Peninsula	Glenwood Elementary	3/10/2022	57	15
Bahia East Peninsula	Loma Verde Elementary School	2/18/2022	21	6
Bahia East Peninsula	Loma Verde Elementary School	3/14/2022	23	5
Bahia East Peninsula	Loma Verde Elementary School	2/17/2022	22	5
Bahia East Peninsula	Loma Verde Elementary School	3/16/2022	24	6

Bahia East Peninsula	Loma Verde Elementary School	3/18/2022	59	6
Bahia East Peninsula	Loma Verde Elementary School	3/14/2022	30	5
Bahia East Peninsula	Loma Verde Elementary School	2/18/2022	27	5
Bahia East Peninsula	Novato Charter School	3/15/2022	28	6
Bahia East Peninsula	Olive Elementary School	3/11/2022	20	6
Bahia East Peninsula	Olive Elementary School	3/11/2022	20	6
Bahia East Peninsula	Ross Elementary School	2/8/2022	37	8
Bahia East Peninsula	San Geronimo Open Classroom	3/9/2022	16	4
Bel Marin Keys	Lagunitas School	2/2/2022	16	5
Bel Marin Keys	Lagunitas School	2/2/2022	11	3
Bel Marin Keys	Lagunitas School	2/2/2022	20	5
Dickson Unit	Vilda	3/11/2022	12	3
Miller Creek Middle School	Miller Creek Middle School	5/4/2022	100	0
Miller Creek Middle School	Miller Creek Middle School	5/5/2022	50	0
Miller Creek Middle School	Miller Creek Middle School	5/3/2022	81	0
Miller Creek Middle School	Miller Creek Middle School	5/4/2022	26	0
Miller Creek Middle School	Miller Creek Middle School	5/5/2022	134	0
Miller Creek Middle School	Miller Creek Middle School	5/3/2022	161	0
Miller Creek Middle School	Miller Creek Middle School	5/4/2022	81	0

Ring Mountain	Marin Country Day School	60	0
	Totals	**1321**	**120**

Task 1: In Class Education

In Marin County in the 2021-2022 school year, we did restoration projects with 1,321 students, 35 teachers, and 120 parents/chaperones. These students, teachers, and chaperones came from 13 Marin County schools. All restoration days were completed between November 2021- May 2022.

During the school year, we provided pre-restoration lessons for all students who attended a restoration, and additional lessons for students who did not complete a restoration, but still wanted to be involved in our program. In total, we provided pre-restoration lessons and full restoration days integrating stormwater pollution prevention for 2,349 students throughout the Bay Area. Table 1.2 shows all totals throughout the Bay Area for the school year.

All of the lessons and restorations we conducted with students, teachers, and chaperones in table 1.1 were in class lessons done in person.

We had 15 Marin County teachers attend Watershed Week last week, which explored pollinators and the critical role they play in our world. This year's Watershed Week focused on pollinators and ways we can help protect them through creating habitat, community science, and more. As always, we aimed to celebrate and nourish teachers with interesting and relevant information, conversation, and network opportunities free of charge.

In being attentive to state and local guidance on the COVID-19 pandemic, we decided a hybrid event (partially on zoom, partially in person) remained the safest and most inclusive for everyone. About 75 folks participated in Watershed Week this year, 31 teachers participated in the in person portion of Watershed Week. Resources from Watershed Week were compiled on a padlet teachers have access to indefinitely: https://padlet.com/ggraziano1/WatershedWeek2022.

Table 1.2 STRAW Wide Metrics

STRAW-Wide Metrics	
Total Students	2349
Restoration Days (with Schools)	54
Total Volunteers	2688

Total Volunteer hours	8648
Total Volunteer Match	$203,746.88
Unique Schools	27
Total Counties (students)	5
Total Counties (restorations)	6
Total Plants	6104
Total Planting Area (acres)	5.04
Total Linear Feet	3978

Task 2

STRAW delivered the final curriculum to students, and implemented the effectiveness assessment protocol, as part of STRAW's school year educational activities between November 2021 and May 2022. Examples of lessons we revised to incorporate MCSTOPPP Public outreach, education and participation objectives are attached to this report as appendix A.

STRAW's Multi-Visit Program (MVP) was able to be reinstated fully in person this year, and we were able to host all Bahia Vista MVP students at restoration days.

A critical learning goal for students was to understand the deep connection between water and land, learning that what we do to the land affects all inhabitants of the watershed. Following the success of past years, we emphasized the importance of storm drains in our first lesson when introducing the connectivity of watersheds. One of our main learning goals was that students understood that all storm drains in Marin discharge any trash or pollutants that people litter or dump directly to the nearest creek or bay. Students learned that when we protect the watershed from harm such as pollution, we are also protecting and helping ourselves and the many species that call our watershed home.

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 site 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 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. (The lessons below were created to be virtual lessons after shelter in place began).

Bahia Vista Lesson 2 (out of 6)

STRAW Learning Plan: Model Makers, Designing Wetlands Transition Zones

Original Lesson Created by Students and Teachers Restoring A Watershed (STRAW)

9:30-10:10 (Doving)

10:30-11:10 (Koller)

11:10-11:50 (Maldonado)

11:50-12:30 (Brand)

Learning Design

Enduring Understanding:

- Students will understand that plants, animals, and people are interconnected.
- Students will be able to identify problems in their watershed and feel empowered and excited to implement solutions through their upcoming restoration project.

NGSS:

- Science and Engineering Practices:
  - Asking questions and defining problems
  - Constructing explanations and designing solutions

- Disciplinary Core Ideas:
  - ESS3.C Human impacts on Earth Systems
  - LS2.A Interdependent relationships in ecosystems
  - LS2.C Ecosystem dynamics, functioning, and resilience
  - LS4.D Biodiversity and humans

- Crosscutting Concepts
  - Cause and effect

- Structure and function
- Stability and change
- Systems and systems models

Learning Plan

Engage (5 minutes):

- Head outside, form a toe-to-toe circle.
- Good to see you again! What do you remember from our last lesson? From your restoration day?
- "I have a challenge for you." Ask students, what is a watershed? Students draft a definition on a half sheet of paper starting with "A watershed is…"

Explore (5 minutes):

- 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 (5 minutes):

- Invite students to sit in the circle.
- Tell students that a watershed is anywhere where water is collected, stored, or drained. 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)
  - Look around, do you see a storm drain?
  - 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.
  - Ask students: are we in a watershed now? Yes! Everywhere you go you are in a watershed
- Review the parts of a watershed
    - Mountains
    - Rivers
    - Wetland (the area we learned about last week/ visited on the field trip!)
    - Bay
    - Ocean
  - Lets Zoom in on the wetland part- that's where we are going for our restoration day!/ where we went for our restoration day

    - Quick review- see if students can remind us- what are the parts of a wetland? (could have students guess one by one, write the first letter of each (UTMO) and then guess, or just tell them)
        - Upland
        - Transition Zone (restoration area)
        - Tidal Marsh
        - Mudflats
        - Open Bay/ Slough
- Quick review (if time) Why are transition zones important?
    - Protect us from sea level rise
    - Provide habitat for animals (i.e. Ridgway's Rails) .

Elaborate (10-15 minutes):

- With materials right here in this schoolyard (give 4 corners parameters to stay within), you have 5 minutes to build a healthy watershed (we are zooming out from last week- so your wetland will be in your watershed!)
- Guide students to start their models by deciding where the mountains/hills are first.
- Another option to do after models are made, or in lieu of models if making them outside isn't possible: Draw what a watershed in their journal.

Evaluate (10-15 minutes):

- On your whiteboard drawing of a watershed, add in details as you ask students what they drew
- In the wetland- What did you put in your transition zone?
    - Be sure to hit all the key features of transition zone restoration:
        - Biodiverse plants
        - Habitat for animals (high-tide habitat (refugia) for the endangered species that live in the marsh)
        - Small grasses and shrubs (no trees in the transition zone- Upland area can have trees and shrubs for habitat and protection/ camouflage)
        - Enough space to absorb high tides
        - Plants that are tolerant to salt water
- Tell students that at their restoration day, they will be helping to make the wetland and transition zone healthier! Your work will increase habitat for animals and create a more resilient ecosystem that is better prepared for a changing climate.
- Exit ticket: Ask students to complete the following sentence starters (in regards to what they just discovered/ learned):
    - I know…
    - I feel…
    - I wonder…
- Last reminders for what to wear/ bring

Materials Needed for this lesson:

- Point Blue name tag
- Field whiteboard
- White board markers
- Half or full sheets of paper for exit tickets
- Pens/ pencils for each student
- Photo of a California freshwater shrimp
- Watch
- Image of healthy wetland/transition zone
- Image of storm drain to reference if we can't find a storm drain nearby
- Hand sanitizer