



Point Blue Conservation Science STRAW Project 2018 Report (December 2017-July 2018)

TASK 1: IN CLASS EDUCATION

SUBTASK 1: STRAW CONTINUES TO EDUCATE MARIN'S DIVERSE COMMUNITIES ABOUT THEIR LOCAL WATERSHEDS AND WAYS IN WHICH THEY CAN REDUCE POLLUTION AND TRASH AND IMPROVE WATER QUALITY, HABITAT, AND COMMUNITY CONNECTIONS. WE CREATED LESSONS THAT INTEGRATED STORMWATER POLLUTION PREVENTION PRACTICES THAT WERE ALIGNED WITH THE NEXT GENERATION SCIENCE STANDARDS. THE CURRICULA HELPS SATISFY PUBLIC OUTREACH, EDUCATION AND PARTICIPATION REQUIREMENTS OUTLINED IN THE PHASE II PERMIT (STATEWIDE MUNICIPAL STORMWATER DISCHARGE PERMIT), AND WAS PRESENTED WITHIN THE CONTEXT OF THE CLIMATE SMART RESTORATION SCIENCE EDUCATION CURRENTLY DELIVERED TO SCHOOLS IN MARIN.

Specifically, between December 2017 and May 2018, we did 5 restoration days in Marin County, worked with 9 different schools, 695 students, 14 teachers, and 36 parents/ guardians (Table 1.1). Four of those 9 schools are schools where over 50% of students are on free and reduced lunch. The total number of Marin students we reached was lower this year than last because we usually work with all three grade levels of Miller Creek Middle School students, which is about 700 students alone. We did work with all 6th grade students at Miller Creek Middle School this school year but were only able to do one restoration at Miller Creek due to contract requirements and complications.

In current literature and conferences on increasing diversity, equity, and inclusivity within environmental education, frequency of lessons is valued much greater than sheer number of students reached. Thus, STRAW has been working to continually improve and expand our Multi-visit program for the most underserved and interested schools to enhance learning and provide more equity in environmental education. MCSTOPPP funding allowed us to do multiple lessons with one of those underserved schools, Bahia Vista Elementary, to increase learning, stewardship, and engagement. Four classes of 5th grade students at Bahia Vista Elementary received 5 separate lessons.

During the 2017-2018 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 for almost 3,000 students throughout the Bay Area. Table 1.2 shows all totals for the 2017-2018 schoolyear.

Table 1.1 Marin County Classroom Totals

<i>School County</i>	<i>Underserved School</i>	Total Students	Total Parents	# of Teachers	# of Schools	
Marin	No	Dixie Elementary School	22	7	1	1
	NO	Loma Verde Elementary School	91	5	2	1
	NO	Miller Creek Middle School	225	0	2	1
	NO	Rancho Elementary School	22	6	1	1
	NO	Tomales High School	14	0	1	1
	YES	Bahia Vista Elementary School	203	2	8	1
	YES	Hamilton Elementary School	54	10	2	1
	YES	Lynwood Elementary School	42	0	2	1
	YES	Short Elementary School	22	6	1	1
Marin Total		695	36	22	9	

Total, throughout the 8 different counties where we work in the Bay Area, STRAW taught watershed science, integrating stormwater pollution prevention, to 2,804 students.

Table 1.2 STRAW Totals

STRAW-Wide Metrics	
Total Students	2804
Restoration Days	51
Total Plants	5561
Total Volunteers	2845
Total Volunteer hours	684
Total Volunteer Match	\$3,446.00
Total Planting Area (acres)	0.85
Unique Schools	36
Total Counties (students)	8
Total Counties (restorations)	5
Total Linear Feet	1020

SUBTASK 2: STRAW EDUCATION STAFF CONTINUED IMPLEMENTING CURRICULA TAILORED TO APPROPRIATE GRADE LEVEL GROUPS, THAT MET THE DISTRICT’S MCSTOPPP PUBLIC OUTREACH, EDUCATION AND PARTICIPATION OBJECTIVES (OUTREACH OBJECTIVES). THE DISTRICT PROVIDED NEW MCSTOPPP OUTREACH OBJECTIVES TO STRAW. THIS TASK LIST IS NOW COMPLETE. STRAW DID THE FOLLOWING:

- a. DELIVERED THE CURRICULA THROUGH STRAW’S 2017-2018 SCHOOL YEAR EDUCATIONAL ACTIVITIES.
- b. INCLUDED THE LATEST INFORMATION REGARDING HOW TRASH GETS INTO WATERWAYS AND SHOW THE MCSTOPPP PDF ON THIS TOPIC TO STUDENTS AND TEACHERS IN APPROPRIATE LESSONS.
- c. OFFERED STORMWATER POLLUTION PREVENTION MEDALLIONS FOR STORM DRAINS TO MARIN COUNTY TEACHERS TO INSTALL ON/ NEARBY THEIR SCHOOL CAMPUSES.
- d. MODIFIED THE CURRICULUM EFFECTIVENESS ASSESSMENT PROTOCOL AS NEEDED.
- e. IMPLEMENTED THE EFFECTIVENESS ASSESSMENT PROTOCOL DURING THE FY 2017-2018 SCHOOL YEARS TO EVALUATE PARTICIPANT LEARNING AS A RESULT OF EXPOSURE TO THE CURRICULUM.

STRAW DELIVERED FINAL CURRICULUM TO STUDENTS, AND IMPLEMENTED THE EFFECTIVENESS ASSESSMENT PROTOCOL, AS PART OF STRAW’S 2017-2018 SCHOOL YEAR EDUCATIONAL ACTIVITIES BETWEEN DECEMBER 2017 AND MAY 30, 2018. AN EXAMPLE OF A LESSON WE REVISED TO INCORPORATE MCSTOPPP PUBLIC OUTREACH, EDUCATION AND PARTICIPATION OBJECTIVES IS ATTACHED TO THIS REPORT AS APPENDIX A.

Within our Multi-visit program, two STRAW interns gained substantial experience with lesson plan development, teaching curricula, assessing students, and responding to students interests while focusing on critical learning goals. Through this program, students became very eager to clean up trash in their own watershed after learning that trash could end up in creeks. As a response to this student interest and effort to meet MCSTOPPP’s outreach objectives in a very hands-on way, we did trash clean ups on our way to and from Pickleweed Park as part of our Multi-visit lessons.

Table 2.1 below lists the classrooms we worked with through our Multi-visit program. These classrooms received 5 total lessons and gained a deeper understanding of their local watershed and ways they can improve it.

TABLE 2.1: MARIN MVP SCHOOL DATA

School Name	Teacher	Grade	Lesson 1	Lesson 2	Lesson 3	Restoration Date	Lesson 5	Number of Students
Bahia Vista Elementary (97.9% of students eligible for	Emily Koller	5th	3/1/18	3/16/18	3/27/18	05/05/17	5/4/18	28
	Kelsey Maldonado	5 th	3/1/18	3/16/18	3/27/18		5/4/18	26
	Kristin Doving	5 th	3/1/18	3/16/18	3/27/18	05/04/17	5/4/18	26

Free and Reduced Meals)	Rachel Marical	5th	3/1/18	3/16/18	3/27/18		5/4/18	27
TOTALS	4 Teachers	-				2 Days		107 Students

BELOW ARE PHOTOS OF MULTI-VISIT PROGRAM STUDENTS FROM BAHIA VISTA ELEMENTARY SCHOOL PLANTING AT PICKLEWEED PARK.



As part of our education plan and each lesson, we assessed students on their learning, reflection, and questions to increase the quality of future lessons and celebrate learning among our students. Our assessment plan was as follows:

Assessment of Students:

- Pre and post oral or written assessments during pre-restoration presentation
- Pre and post oral or written assessments during restoration day
- Oral responses to questions at restorations
- STRAW Multi Visit Program (MVP) students complete end of program reflections and share out with each other

More specifically, we asked students what they know, feel, and wonder at the end of pre-restoration lessons and what they hope their restoration sites will look like in 20 years at the end of the restoration day. Both assessment techniques provided our educators will incredibly useful information which we were able to synthesize, type up and share with teachers and the project managers for the restoration sites. This allowed information from the pre-restoration lesson to carry continuously into the restoration day. It also allowed the teacher and project manager to highlight specific interests, curiosities, and questions they had to make the restoration experience more personalized for our students. This inquiry-based, student-interest based form of education is and has always been integral to STRAW- and is how our project began.

In regards to storm drains specifically, students learned that storm drains are part of their watersheds. Each class either went outside, identified storm drains and discussed how they were connected to the watershed, or were shown a picture of a storm drain with that same discussion to follow.

When we asked MVP students what they would change about the program, students wrote:

- Have STRAW all over the world
- Work with even more schools
- Come more often
- More games
- More school beautification
- More time together!
- Together, pick up more trash in Pickleweed
- To plant every time ;)
- More activities/games
- Art project on last day

With continued, reliable funding from MCSTOPPP, we are elated that we will have the opportunity to respond to students desires for improvement, expand our program, and keep inspiring students throughout Marin County.

Examples of student's responses to what they hope their restoration site will look like in 20 years:

20 years from now, I hope to
See my plant as big as the tree
Right beside it.
-Kelly L.

Twenty years from now, I hope...
The fox tails will not rule over the marsh
The sage will grow big but not too big
The tree will have more branches and leaves
My plant will grow as big as bigfoot
The yellow plant will grow
-Michelle K.

Twenty years from now, I hope...
That endangered animals
Get homes and that people
Love animals the way we do and
That trees keep growing, birds
Keep singing and that caterpillars
Grow into beautiful
Butterfly
This is
Twenty years from now
-Mia E.

Twenty years from now, I
Hope my plant has grown
Big and given shelter
And food to many animals
-Jennifer

Twenty years from now I hope, I get to meet
S.T.R.A.W. and get to plant more plants.
And I hope when I come back I see
that animals or insects have make
the plants that we planted make it
Their habitats and useful for them
-Marisela C.

Twenty years from now I hope
More people come and
Take care of plants.
Also animals enjoy there

habitat.
-Vielman

Twenty years from now,
I hope my plantes grow and
Be big and have water and the
Sun. Also, I hope to come
To the bay and come
To see the plantes.

In 20 years I hope,
My plant grows big
I hope my plant grows strong
I hope my plant is well
I hope people see my plant in 20 years
-Karen

In 20 years I hope...
The plant that I grew to be alive.
Pickleweed to look pretty in 20 years.
The plants to not die,
I hope I still feel the same in 20 years.
-Jimmy

In 20 years I hope
The plants will
Grow to
Be 20 feet
Tall I hope
People remember
To love
Nature
And its
Surroundings
-Madeline

In 20 years I hope...
There is no trash in the
Water. I hope the
Plants get plenty of
Water to grow more
Bigger. I hope nobody
Will pollute the
Ocean so animals don't
Die by eating
Plastic. I hope

Plants get enough
Water. I hope I see
Chipmunks in 20
Years
-Leslie

Twenty years from now, I hope
Pickleweed park will be prettier than
Now. In twenty years from now I hope
Every person can pick up trash. Twenty
Years from now I hope there won't be
Any ore trash on the park of the
Field. Twenty years from now I hope
My plants and my sister's plant and everyone's
Plant will grow really big and pretty.
-Adan

Twenty years from now I hope there
Will be loads of people will start
Planting to make our earth
Beautiful. If that happens the earth
Will have more oxygen and more
Habitat for animals
I hope people will learn that planting
Is important because its good
For the environment.
-Andres

Twenty years from now, I hope...
That this plant will be alive
And be big so it can helpful to nature and animals.
I hope too that this beautiful
Land will be even more prettier
And bigger
-Pedro D.

Twenty years from now, I hope
Other Bahia Vista students will
Be planting other plants in
Pickleweed. Hope insects can
Have more habitats.
-Lainey

Twenty years from now, I hope
That the plants will be bigger
And make a beautiful habitat for

The insects. The people should
Notice that they should not
Litter on that area. The plant
Will grow and give us oxygen
To breathe.
-Giselle

Twenty years from now, I hope the plants
That Bahia Vista had planted would grow
So tall and make Pickleweed an awesome place.
-Madaline

Twenty years from now, I hope
That the plants we planted will grow
Tall and strong and make the community
A better place. I hope the plants
Will save us if there was every a flood.
-Darlene

Appendix A: Sample lesson revised and implemented to incorporate MCSTOPPP outreach objectives

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

Learning Goals

Enduring Understanding:

- Students will understand what a watershed is and that they will make a difference improving their watershed through our work together
- The more you look, the more you see

NGSS Standards Met:

- Science and Engineering Practices:
 - Developing and using models
 - Obtaining, evaluating, and communicating information
- Disciplinary Core Ideas:
 - LS2.A Interdependent relationships in ecosystems
 - LS2.C Ecosystem dynamics, functioning, and resilience
 - LS4.D Biodiversity and humans
 - ETS2: Links among engineering, technology, science, and society
- Crosscutting Concepts
 - Patterns
 - Structure and function
 - Stability and change
 - Systems and systems models

Essential Question(s):

- What is STRAW and what is my role within the program?
- What is a watershed? Where does water go in my watershed?
- The more you look, the more you...?
- What is a wetland?

Students will know:

- The story of STRAW and how it began
- The ways in which we act as a community with STRAW
- The basic progression of the program
- 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

Students will be able to:

- Identify what they most hope to learn from our program this year
- Use and practice observation skills

- Identify storm drains on their campus and share with a friend where the water goes

Learning Plan

Engage: (Indoors) 10 min 2-GG, 3-CK, 4-PF

- Introductions- Point Blue- STRAW
- Share goals of our program with students, share enthusiasm for working with them
- Challenge! I'm wondering if anyone knows or remembers what a watershed is, what is a tidal wetland, and why a tidal wetland is important.
- Pass out pre-assessments, give students 5-8 minutes to complete.
- After pre-assessments are complete, turn your page over, pencil down and, write your name with a marker on the name tag/ tape we pass out (if students don't already have name tags on)

Explore: 5 min 2-GG, 3-PF, 4-CK

- Story of STRAW & What we will do together
- What is a watershed? Think-pair-share
 - Hint: we are in a watershed right now, look around (or out the window), do you see hills? Where would water flow if it were to rain right now? (point)
 - What happens to trash on the ground on our own school campus? Where does it go when it rains?
- Where are we in the watershed right now?
- Instructions for going outside

Walk outside- 5 min

Explain: (Outside, if weather allows)- 6 min total- 1-GG, 2-CK, 3-PF, 4-CK

What is a watershed?- 5 min

- What is a watershed? Think-pair-share
- Direct Instruction: Tell students that a watershed is anywhere where water is collected, stored, or drains. Ask students to look around, do they see any hills, mountains, taller parts of their school yard/ Pickleweed Park? When it rains, where does that water go? (2-3 volunteers share out)
 - All water eventually flows to a stream or lake and ends up in the ocean.
 - Water "sheds" off the mountains
 - No matter where on Earth you go, you're always in a watershed!
 - A watershed starts in the mountains/ hills, goes to rivers, then wetlands, then the bay, then the ocean
 - Point to storm drains you see here- those storm drains flows to local creeks and bays- like San Pablo Bay right here- runoff flows either directly or through storm drains
 - Show laminated photo of a watershed
 - Show How Trash Gets Into Creeks graphic

Elaborate: (Outside)- 14 min 1-GG, 2-GG, 3-CK, 4-PF

What is a wetland?- 5 min

- Where are we in the watershed right now? We are next to the wetland!

- Wetlands are literally areas of land that are wet
- Challenge for you: Be a scientist- observe what you see, draw the wetland from this tree to the island, then we share top secret info- there are 4 key sections to a wetland- can you label them in your sketch?
- Toe-to-toe circle: Our wetland has four key parts: Upland, Tidal Marsh, Mudflats, and Open Bay (UTMO)- label the 4 parts of your wetland in your small groups in the circle- we will learn about the roles of the wetland and those parts of the wetland through our program
- Ask students: Why are wetlands so important? We will talk more about wetlands next time, but start observing and asking questions!
 - Habitat, biodiversity, quality and quantity of water, etc.

Walk inside- 5 min

Evaluate: (Indoors)- 5 min, 1-GG, 2-GG, 3-CK, 4-PF

- Return to desks.
- On the other side of your piece of paper, write what you now know a watershed is, what you now know a wetland is and please write what you hope to learn from doing STRAW this year/ what you are most excited to learn.

Materials:

- Learning Plan
- Name tags for students and STRAW teachers
- Field white board
- White board markers
- 1 blank piece of paper/ student
- Pre-assessments for all students
- Pens/ pencils for each student
- Photo of a California freshwater shrimp
- Floppy white boards
- White board markers



Conservation science for a healthy planet.
 3820 Cypress Drive, #11 Petaluma, CA 94954
 T 707.781.2555 | F 707.765.1685
 pointblue.org

INVOICE

Date: August 1, 2018

Invoice 7142D-1

TO: Howard Bunce
 Marin Couty Stormwater Pollution Prevention Program
 PO Box 4186
 San Rafael, CA 94913-4186

FOR: **STRAW Education and Outreach in Marin County agreement #31800974**

Total Contract Amount:	\$ 11,000.00
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Completion of project scope of work as per contract

TOTAL DUE	\$ 11,000.00
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Total billed previously	\$ -
This invoice	\$ 11,000.00
	\$ 11,000.00
Total remaining in contract after above payment	\$ -

Tax ID # 94-1594250
 Please remit payment to: Point Blue Conservation Science
 3820 Cypress Drive #11
 Petaluma, CA 94954

please direct questions to Karen Carlson: kcarlson@pointblue.org 707-781-2555 x350