



## WHAT'S IN THE BOOKLET?

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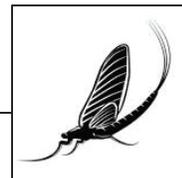
### How to use this Activity Booklet

Each page will have something for you to read, write, draw, color, or reflect on (hint: look for the mayfly symbol for special questions to answer). Fill out as many pages as you can, either alone or with a friend! Or maybe a family project?

**TIP:** Look for the mayfly symbol throughout the book. Each one will mark a special question for you to answer. For example:

*How many mayflies can you find in this book?*

**YOUR ANSWER HERE:**



## **This book is inspired by the Coos Watershed Mayfly Festival. What's that?**

The Mayfly Festival is an event sponsored by the Coos Watershed Association and other local partners, designed to shed light on connections between community, the environment, and water. It's an activity-based event that encourages people of all ages to explore, observe, and learn about our incredible watershed.



We chose mayflies as the central symbol of this festival because they are an important, but often overlooked, part of a healthy watershed ecosystem. Throughout their lives, mayflies signal healthy water quality (**bioindicators**), feed hundreds of other animals, and remind us how fragile aquatic ecosystems are—and how we can protect them.

In 2021, we developed a Mayfly Festival Activity Booklet to give people another way to celebrate the Mayfly Festival each year. This is the second edition!

### **Thank you to our 2022 Activity Booklet partners and contributors:**

Braemar Charitable Trust ~ Coos Bay Public Library  
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians  
Coos Head Food Co-op ~ North Bend Public Library  
Oregon Sea Grant ~ South Slough National Estuarine Research Reserve  
University of Oregon's Charleston Marine Life Center ~ Wegferds' Printing

### **And to all of our other community supporters!**

7 Devils Brewing Co ~ Bach2Basics Lesson Studio  
Banana Slug String Band ~ Blazing Bulldogs Pizza ~ BNT Promotional Products  
The Buzz Krill ~ Cape Arago Audubon Society ~ Coos County Cultural Coalition  
City of Coos Bay Public Works ~ Coos Art Museum ~ Coos Bay Surfrider  
Coquille Indian Tribe ~ Coquille Watershed Association  
Destinations Academy ~ Dr. Holt Family Dentistry  
Family Chiropractic Center ~ Hillcrest Choir and Marimba Ensemble  
Josie's Art Lab ~ Make Art Not Trash  
Marshfield High School Science National Honor Society & Z Club  
The Metro Gnomes ~ North Bend High School Science National Honor Society  
Northwest Natural ~ Oregon Department of Fish and Wildlife ~ Oregon Youth Corps  
OSU Extension ~ Sea Kitty Seafoods ~ Side of the Tide Morris Dancers  
So It Goes Coffeehouse ~ South Slough National Estuarine Research Reserve  
Southwestern Oregon Community College ~ Wild Rivers Land Trust

## Why the mayfly?

The mayfly is an insect that lives in the water for part of its life and then on land—if it makes it that far! Unfortunately for the mayfly, one of its most crucial roles is becoming food for other animals, like salmon.



**WRITE YOUR ANSWER HERE:**

*Trees drop leaves in the water and feed the mayflies.*

*Mayflies feed the salmon.*

*Salmon feed the trees (tree roots absorb salmon nutrients).*

*Then the cycle continues!*

Without the mayfly, what would happen to the food web??

## Amazing mayfly facts

- ❖ Mayflies live underwater for most of their lives. You can find them in rivers, creeks, and sometimes ponds.
- ❖ Mayflies can only live in clean, healthy water, and they indicate (warn us about) pollution based on where we find them—and where we don't find them. For this reason, we call them **bioindicators**. Stormwater runoff is one of many threats to mayflies.
- ❖ After living underwater for a year or two, they transform into adult insects that can fly! (P.S. so do dragonflies, mosquitoes, & many other aquatic insects).
- ❖ Mayflies only live for a few hours as winged adults! Many adults don't even have mouthparts, because why bother?
- ❖ Mayflies are a great snack for worms, flies, beetles, frogs, birds, dragonflies, fish, and many other critters throughout their lives.
- ❖ There are at least 700 different species of mayflies in North America!

## Advice from a mayfly

"Stay away from stormwater runoff!"

"Life is short. Make every moment count!"

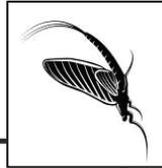


# Mayfly life cycle coloring sheet

The diagram illustrates the life cycle of a mayfly in a circular path. It starts with **EGG** in the water, which develops into a **NYMPH**. The nymph then becomes an **EMERGER** as it moves from the water to the land. On land, it becomes a **DUN**, which then matures into a **SPINNER**. The spinner is shown laying eggs back into the water, completing the cycle. The background features a river with fish, reeds, and various stages of mayflies. Logos for 'THE MAYFLY SUPPER' and 'COOS Watershed Association' are present.

Mayflies live both on land and in the water throughout their life cycle. Can you tell which stages above are adults (land) and which stages take place underwater?

**WRITE YOUR ANSWER HERE:**



## Mayflies live in a watershed. What's that?

A **watershed** is an area of land that drains, or "sheds," water into a specific waterbody. Imagine rain flowing down a mountainside into a lake or the ocean. The whole surrounding landscape is a watershed, with water flowing to a single point—from a high elevation to a lower one. Watersheds can be HUGE, like the Mississippi River watershed that drains over one million square miles of land and encompasses 32 U.S. states and two Canadian provinces—or small, like the Mingus Park watershed (water from surrounding neighborhoods drains to pond).

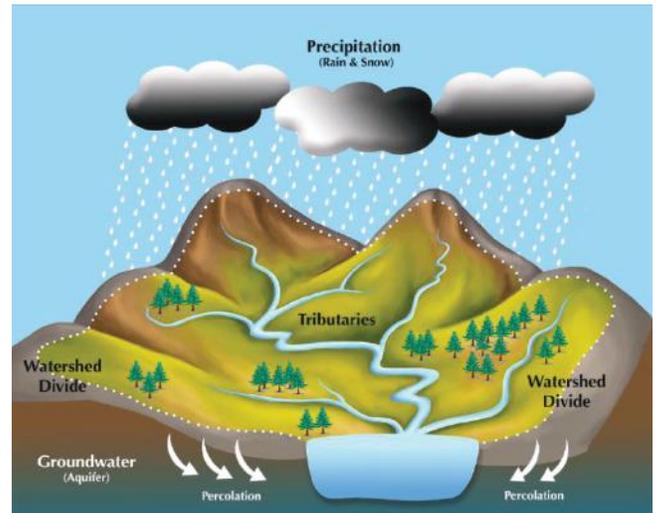
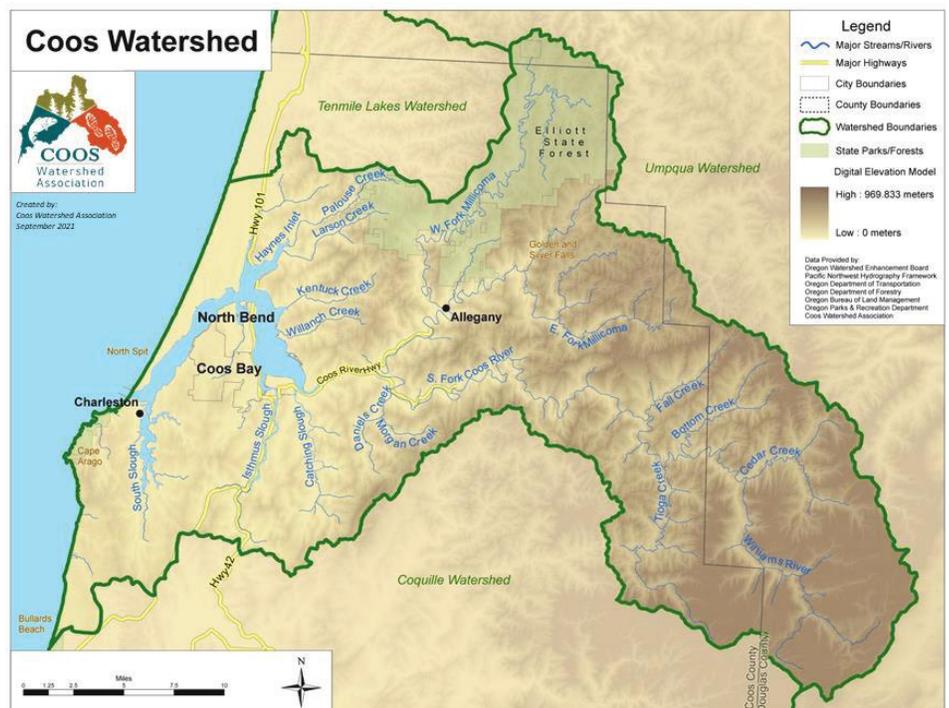


Photo credit: Center for Watershed Protection, <https://www.cwp.org/>

The **Coos watershed** is a 610 square mile area that encompasses all the land and waters draining into the **Coos estuary** and ultimately the Pacific Ocean. The watershed is home to many different plants, animals, and people.

There are two other watersheds in Coos County: the Tenmile Lakes watershed to the north and the Coquille watershed to the south also both drain into the Pacific Ocean.



The **Coos Watershed Association** is a non-profit watershed council that leads restoration, monitoring, and education activities in the Coos watershed. Watershed councils are locally organized, voluntary, non-regulatory organizations whose mission is to improve the quality of our local home watersheds. We are one of over 90 watershed councils in Oregon, but as far as we know, we are the only one with a Mayfly Festival :-)



**CHALLENGE:** I live in the \_\_\_\_\_ watershed!

**CHALLENGE:** Find your home, school, or work and mark with a ☆

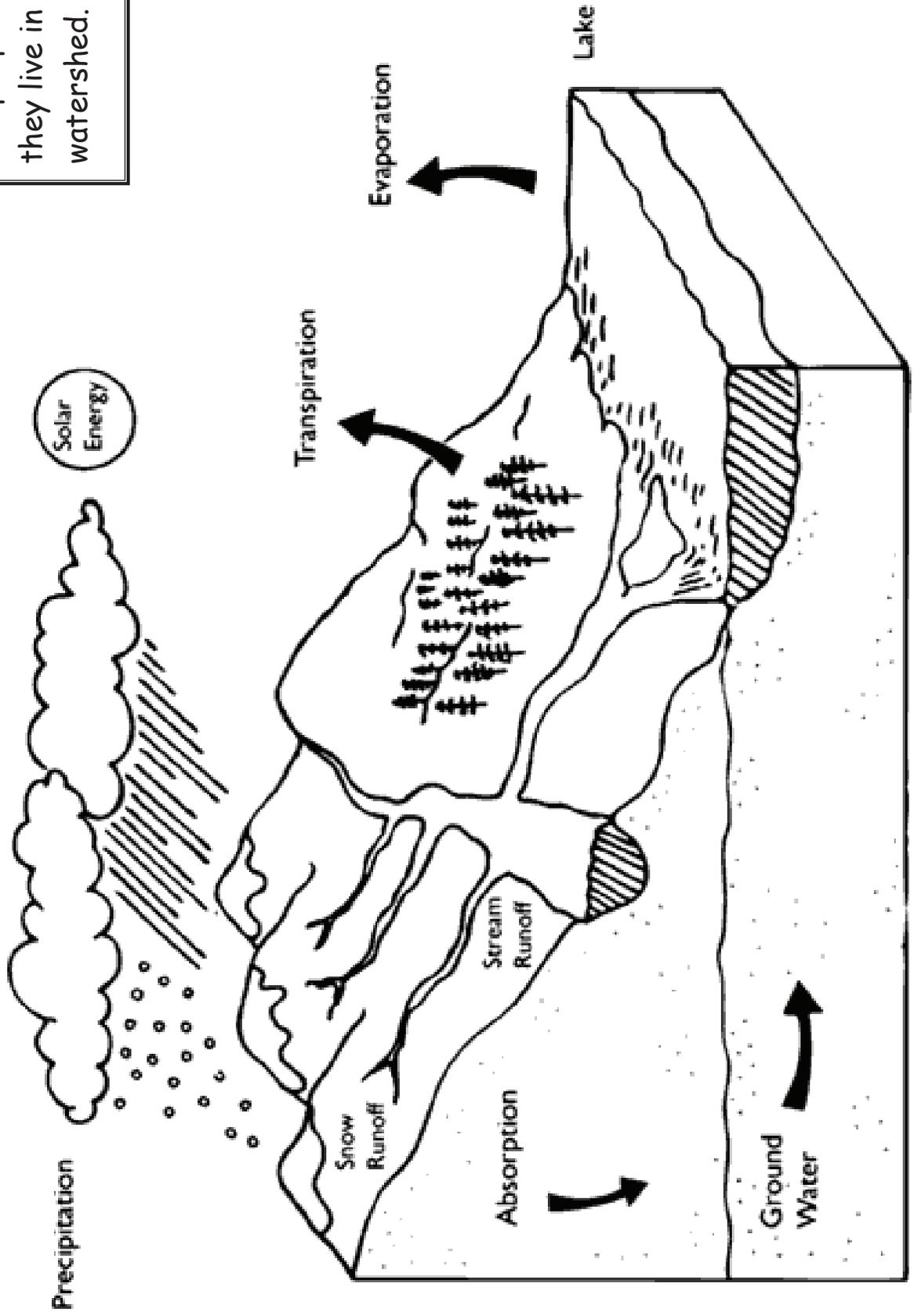
# We All Live in a Watershed



## CHALLENGE:

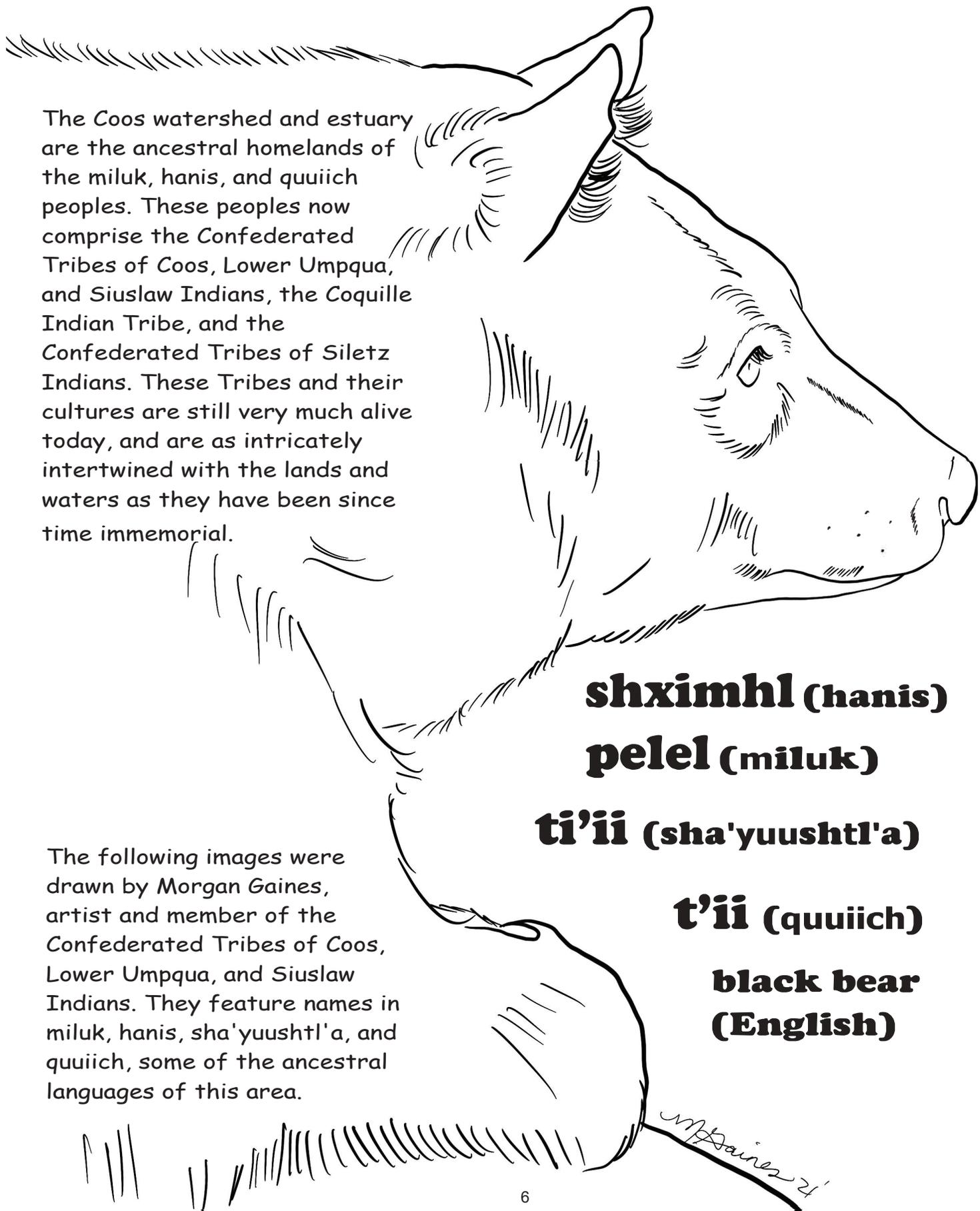
Add plants, animals, and people where they live in the watershed.

## WATERSHED DIAGRAM



## People of the Coos watershed

The Coos watershed and estuary are the ancestral homelands of the miluk, hanis, and quuiich peoples. These peoples now comprise the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, the Coquille Indian Tribe, and the Confederated Tribes of Siletz Indians. These Tribes and their cultures are still very much alive today, and are as intricately intertwined with the lands and waters as they have been since time immemorial.



**shximhl (hanis)**

**pelel (miluk)**

**ti'ii (sha'yuushtl'a)**

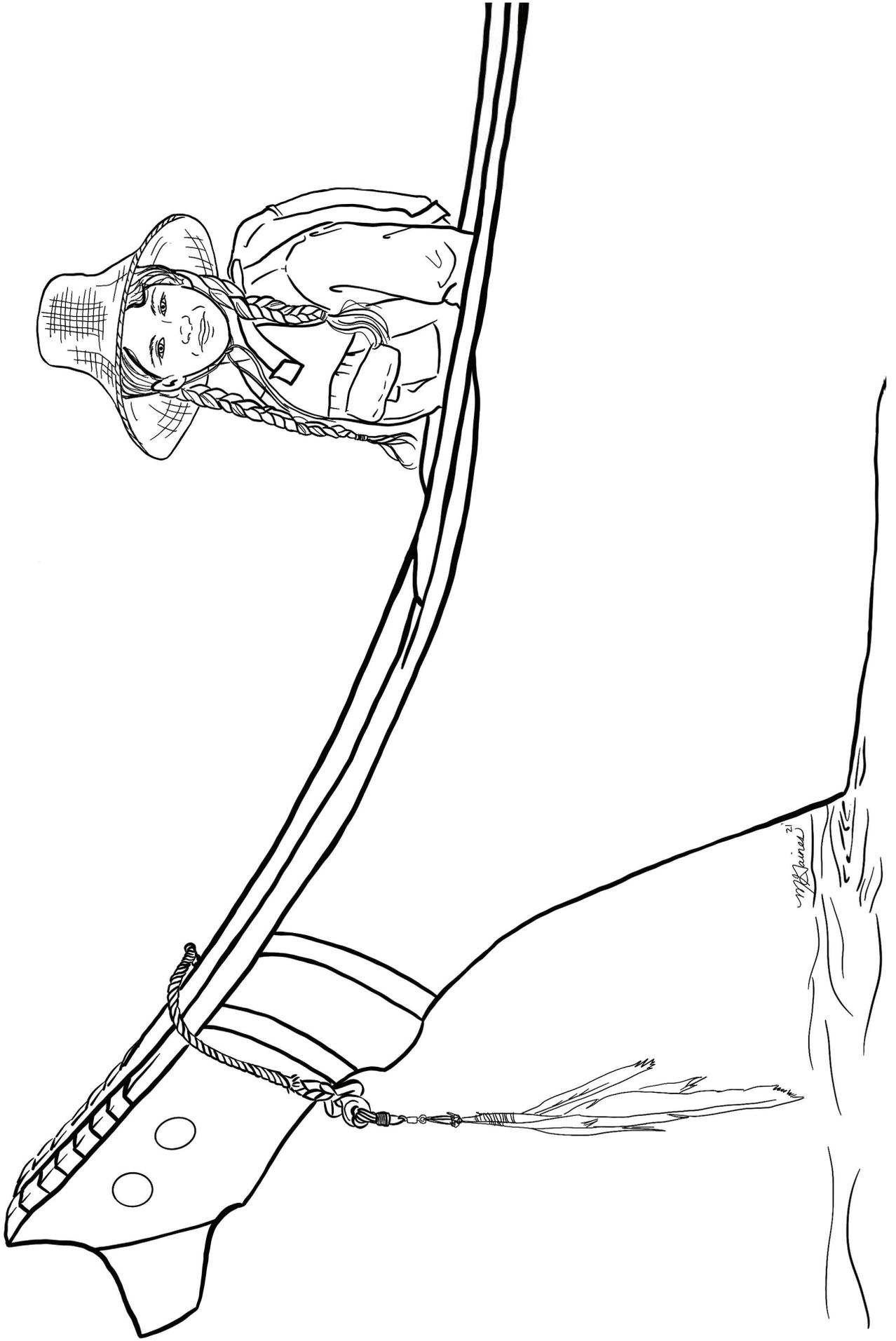
**t'ii (quuiich)**

**black bear  
(English)**

The following images were drawn by Morgan Gaines, artist and member of the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians. They feature names in miluk, hanis, sha'yuushtl'a, and quuiich, some of the ancestral languages of this area.

**Ix** (hanis) **Tlguus** (miluk) **Siixai** (sha'yuushtl'a uhl quuiich)

canoe (English)





**pkiisawas** (hanis)

**pkiis** (miluk)

**chaaxan** (sha'yuushtl'a uhl quuiich)

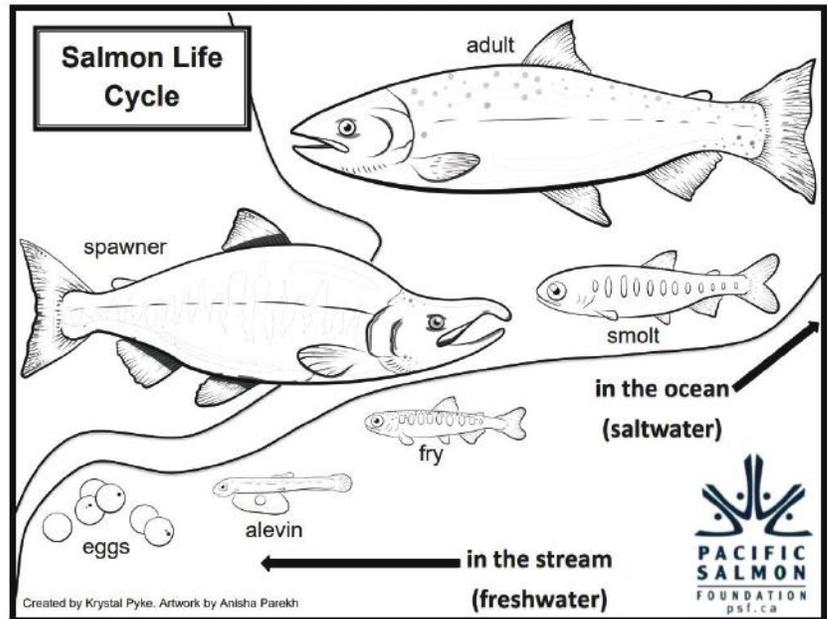
**flower** (English)



# Salmon in the Coos watershed

## Salmon life cycle

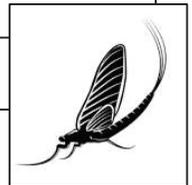
Just like mayflies, salmon have a complex life cycle with many stages (except all of theirs happen underwater!). When **eggs** hatch, they become **alevin** (they keep a yolk sac from the egg and stay in the gravel nest at this stage). Next, they leave the gravel nest and begin to feed as **fry**, begin their journey to the ocean as **smolt**, stay in the ocean for a year or more as **adults**, and return to their home streams as **spawning adults**.



Can you guess which stage salmon are in when they are....

- Eating mayflies? \_\_\_\_\_
- Spending time in the ocean? \_\_\_\_\_
- Laying eggs in freshwater streams? \_\_\_\_\_

What does **spawning** mean? \_\_\_\_\_



## Protecting future salmon populations

Salmon are vital to our coastal environment, culture, economy, and way of life. Similar to mayflies, salmon rely on (and therefore **indicate**) clean, clear, cool, and healthy water to survive.

The Oregon Coast coho salmon is **threatened**, which means its populations and habitats need our help. What is one thing you can do to help coho salmon? Hint: look for ideas throughout this booklet). **WRITE YOUR ANSWER HERE:**

# Impacts to a watershed

What we do on land impacts the quality of the water around us.

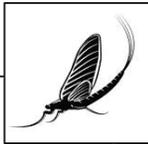
Within a watershed, water moves across land from a high point to a low point. This can sometimes cause problems if that water is picking things up along the way...

If you have spent any time in downtown Coos Bay or North Bend, you may have noticed these small medallions next to some of the storm drains.

And maybe you've seen the storm drain murals in downtown Coos Bay! If not, pick up a map from the Visitor Center or download one here: <https://cooswatershed.org/wp-content/uploads/2022/04/Storm-drain-mural-map-brochure.pdf>



## Quick quiz for you:



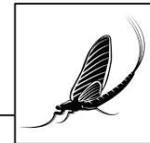
When rain falls on the pavement in the Coos watershed, it ends up in a storm drain like the one pictured above. Where does the water go next?

- A. Nowhere—it just stays right there
- B. Underground, never to be seen again
- C. To a wastewater treatment plant to get cleaned
- D. Local creeks and the bay

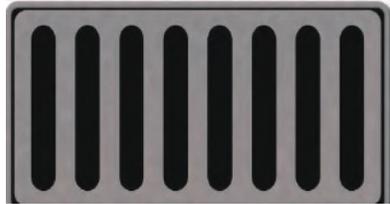
## One more...

How many of these things end up in storm drains?

- A. Rain water
- B. Soap from people washing cars
- C. Oil
- D. Gas
- E. Heavy metals
- F. Fertilizer
- G. Pesticides
- H. Animal waste
- I. None of the above
- J. All of the above



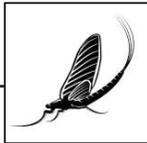
If you selected the last choice on each of the questions on the previous page, you are RIGHT! In most cities, storm drains connect directly to waterways, like rivers, lakes, bays, and the ocean. There is no filter, so this **stormwater** brings all sorts of gross things into our waterways. This is different from the water from a washing machine, toilet, or sink inside your house, which ends up in a wastewater treatment plant to be cleaned.



Stormwater is a HUGE problem for the animals that live in our creeks and bay, so we started designing murals to educate our community on this issue. Look for these murals around downtown Coos Bay!

*If you were one of our artists, what would YOUR storm drain mural look like?*

**YOUR STORM DRAIN MURAL DESIGN HERE:**



**TIP:** If you need inspiration, do a web search for "storm drain murals" and you will see lots of cool designs!

# HEALTHY WATERSHED QUIZ

Here are five ways we can help our watershed on a daily basis. Read through these ideas, then take the "How Watershed-Friendly Are You?" Quiz!

## 1 ONLY RAIN DOWN THE STORM DRAIN

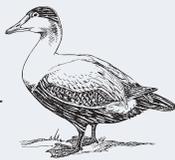
Storm drains connect directly to our waterways, so when it rains, all that water carries oil, gas, pesticides, fertilizers, heavy metals, garbage, and other pollutants to our creeks and bay. There is no filter! Even if you can't see any water nearby, anything falling onto pavement will make its way to a water body eventually. How to help:

- Check your car, boat, and equipment for leaks and clean up spills immediately
- Limit your use of fertilizers and pesticides, which impair water quality for fish
- Dispose of trash and cigarettes in specified bins
- Consider a rain garden, bioswale, or rain barrel on your property to reduce runoff into storm drains
- Never dump anything down a storm drain, especially hazardous materials like motor oil, auto fluids, or paint
- Visit the storm drain murals in Coos Bay

## 3 KEEP ANIMAL WASTE OUT OF STREAMS, RIVERS, PONDS, BAY

Animal waste causes bacteria growth and algae blooms, which damage water quality for fish and other aquatic organisms.

- Pick up dog poop so it doesn't end up in a creek
- Avoid feeding ducks [or any water birds] because more food leads to....
  - Over-crowding
  - More waste
  - Algae and bacterial growth
  - Depleted oxygen levels in water
  - Sick or aggressive wildlife ☹️



## 2 DITCH THE PLASTICS

Single-use plastics account for a huge percentage of our waste stream, and many end up in our waterways.

- Re-use something that you could have just thrown away [e.g., water bottle]
- Use a plastic-free alternative [reusable straw, water bottle, coffee mug, etc.]
- Attend a beach clean-up [or do your own!]. For Surfrider Foundation events, visit <https://coosbay.surfrider.org/events/> or <https://www.solveoregon.org/>
- Support sustainability-minded businesses, such as "ocean friendly restaurants" certified by the Surfrider Foundation [those that don't use or sell single-use plastic items and meet other sustainability criteria].



## 4 MAKE YOUR CAR WASH SALMON-FRIENDLY

When a car is washed on pavement, the hot, soapy water will enter a storm drain and end up in a creek or the bay, impairing the water quality for fish and other aquatic wildlife. This is especially harmful if the soap contains phosphate, which causes excess algae growth and takes oxygen out of the water [bad for fish]. But there are some "salmon-friendly" alternatives!

- Use phosphate-free soap or skip it entirely [most types damage fish gills and kill eggs]
- Wash your car on gravel or grass so the runoff goes into the ground instead of a storm drain
- Wash your car at a commercial car wash so the runoff goes to a wastewater treatment plant



## 5 CONNECT WITH YOUR LOCAL WATERSHED COUNCIL

For more info on any of the above, or to find out how, when, and why to volunteer or work with us, drop us a line! We'd love to hear from you.



cooswa@cooswatershed.org  
www.cooswatershed.org  
[541] 888-5922  
300 Central Ave, Coos Bay

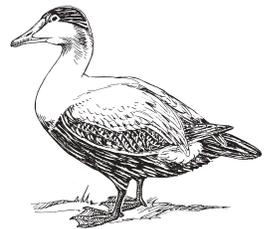


# HOW WATERSHED-FRIENDLY ARE YOU?

## TAKE THE QUIZ

We make choices every day that impact the rivers, bays, and oceans around us—and the plants, animals, and people that depend on them. Think back to the last month: how many of the following actions have you taken?

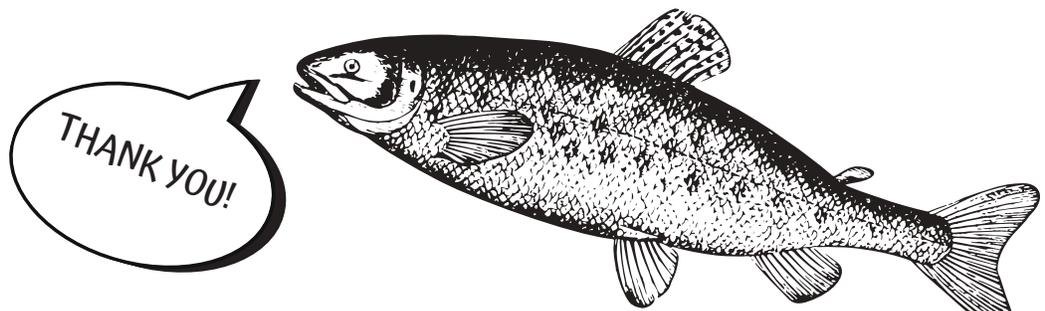
- Disposed of hazardous waste [oil, auto fluids, chemicals, paint, etc.] in specified areas [NOT storm drains]
- Checked my car, boat, and equipment for leaks and/or cleaned up a spill immediately
- Disposed of trash and cigarette butts in specified containers
- Picked up garbage from beach, trail, or public area
- Limited/cut back on my use of fertilizers and pesticides
- Landscaped with native plants and/or reduced the size of my lawn
- Washed my car with phosphate-free soap OR no soap at all
- Washed my car at a commercial car wash OR on gravel/grass
- Picked up dog poop on a walk and/or avoided feeding ducks
- Added [or considered adding] a rain garden, bioswale, or rain barrel to my yard to reduce runoff into storm drains
- Visited the storm drain murals in Coos Bay, or read about them in the Coos Watershed Association's mural walk brochure
- Visited <https://www.surfrider.org/programs/ocean-friendly-restaurants> or <https://cooswatershed.org>
- Re-used something that I could have just thrown away:



-----  
 Used a reusable, plastic-free alternative:  
-----

Supported sustainability-minded businesses, such as: -----  
And: -----

SCORE: \_\_\_\_/15      GOAL FOR NEXT MONTH: \_\_\_\_/15



## Outdoor places to visit in the Coos watershed

There are so many great places to explore, observe, and enjoy nature and wildlife in our watershed!

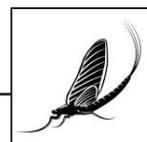
**CHALLENGE:** Explore one of these places, or another favorite of yours, and tell us about it below!

- Millicoma Marsh Trail
- Golden and Silver Falls State Natural Area
- Oregon Dunes National Recreation Area
- Bluebill Trail (in the Oregon Dunes)
- University of Oregon's Charleston Marine Life Center
- South Slough National Estuarine Research Reserve
- Shore Acres State Park and Lighthouse
- Sunset Bay State Park
- Mingus Park
- Ferry Road Park
- North Bend Boardwalk
- Coos Bay Boardwalk
- Horsfall Beach
- Bastendorff Beach
- Another favorite place of mine to explore is:



*What's something you observed when you visited one of these places?*

**Describe or draw here:**





Unscramble these words to identify animals found in an estuary and at the CMLC!

The CMLC is open Wednesdays through Saturdays 11am-5pm. Kids free, Adults \$5

[cmcl.uoregon.edu](http://cmcl.uoregon.edu)

ABY EIPPHIFS

ABCR

PSCULIN

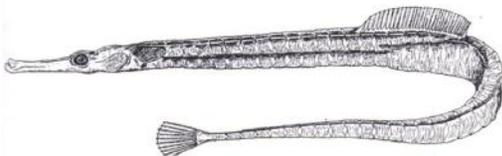
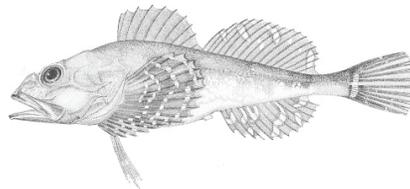
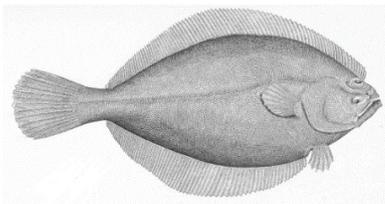
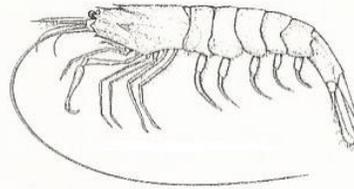
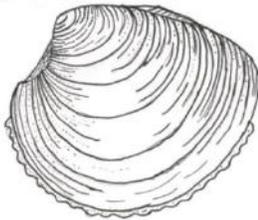
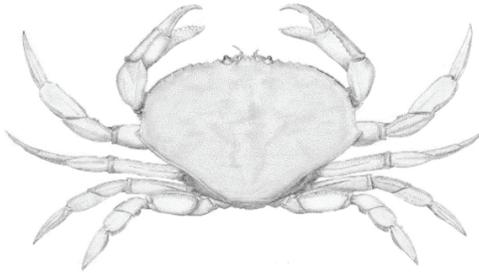
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## JUNIOR RESEARCHER ACTIVITIES



Blue & Lou

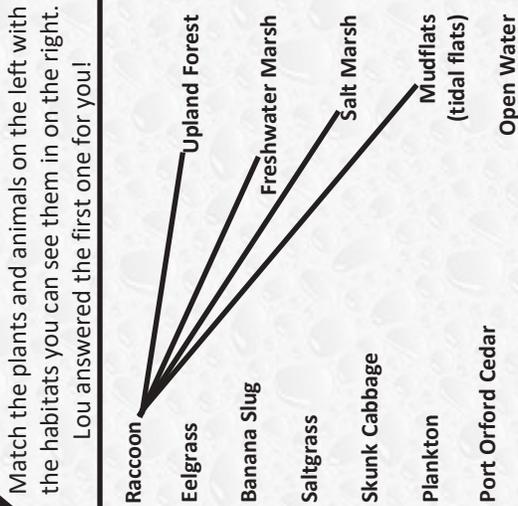
Blue and Lou are junior researchers. They collect information to help study and take care of the South Slough Reserve.

Lou and Blue made these activities for the Mayfly Festival to help people learn about the Reserve, the estuary and our watershed. Check them out to start becoming a JR Researcher!

Sometimes Blue & Lou take a watershed hike through South Slough's habitats, recording observations about what they see, hear, smell, feel and taste in each place!



South Slough's Five Habitats



Match the plants and animals on the left with the habitats you can see them in on the right. Lou answered the first one for you!

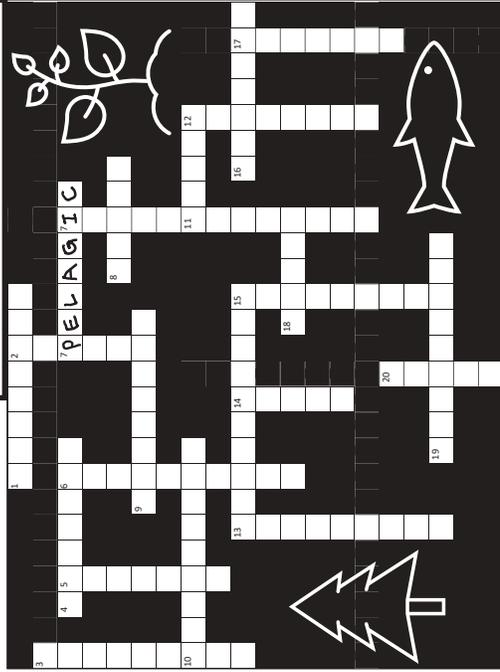
Get outside and explore like Blue and Lou! Think, question, guess. Use the second page to draw, write, and share what you noticed with a friend.

### LOU'S TIPS FOR NOTICING DETAILS

"Don't rush. Use all of your senses. Look at things from new angles – what does the world look like for an ant on the ground?"

## Crossword Challenge!

The clues below include hints about other words in the puzzle. Blue answered one to get you started!



Across

1. Measure of salt in water.
4. Bottom region or zone of a body of water.
7. Free-swimming fish and offshore birds; the open ocean
8. Flowing body of water that mixes with the incoming ocean tide to form an estuary.
9. Aquatic plant who's dense under water meadows are habitat for baby fish and crabs.
10. Nourishment plants and animals need to grow.
11. The rising and falling of water along the coast.
13. Wide areas of the estuary made of mud or sand, great for damming.
16. Animal's home environment.
18. Latin word for plants.
19. Area of land draining or "shedding" to a common creek or bay.

Down

2. Contributions of energy or materials to a system.
3. Non-living particles suspended in the water; affect turbidity.
5. Where rivers meet the ocean
6. Area of shore exposed at low tide and covered by high tide.
7. Group of animals with no spine or backbone.
12. Habitat zone below the intertidal zone never uncovered by low tide.
13. The amount of sediment suspended in the estuary's waters; affects light and water clarity.
14. Latin word for animals.
15. Wetland periodically covered with water by the tide with lots of salt tolerant plants.
17. Water-based or living in water
20. Covers 75% of the earth's surface; floods the estuary on high tide

# JUNIOR RESEARCHER NOTES FROM THE FIELD

# Keep

DATE:

LOCATION:

Draw a detailed picture of a thing you found.

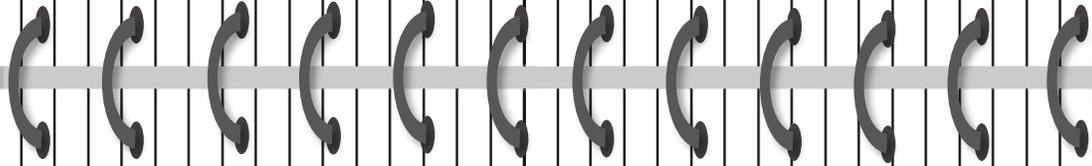
**LOU'S TIPS FOR  
DETAILED DRAWING**

"Take your time.  
Draw lightly at first;  
it will make it easier  
to make changes."

Record words about what you found.

**BLUE'S TIPS FOR  
SHARING DETAILS**

"Describe colors,  
shapes, texture, smell,  
behaviors."



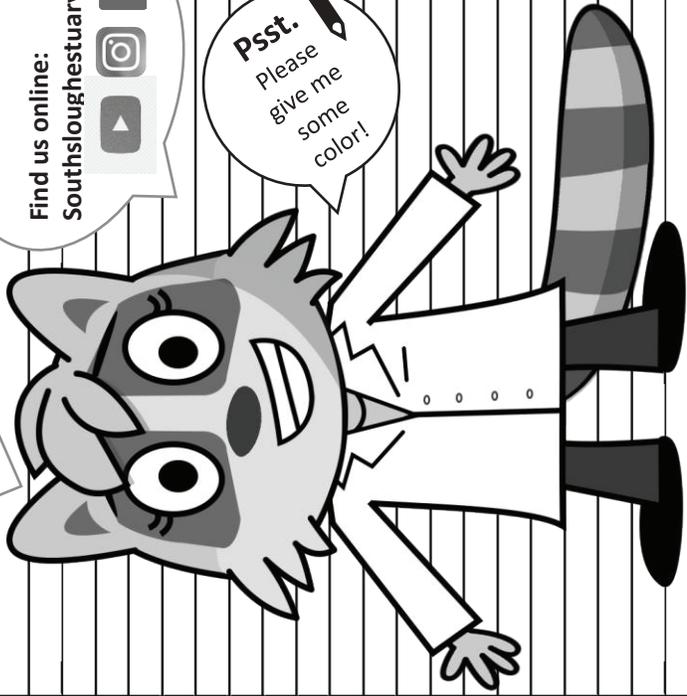
# exploring!

Our trails are open every  
day from dawn to dusk.  
Our Visitor Center reopens  
on May 3, 2022!  
61907 Seven Devils Road,  
Charleston

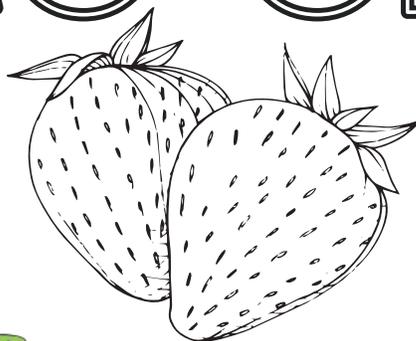
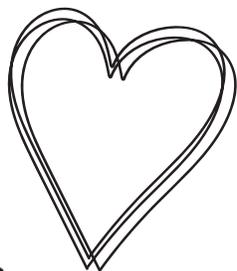
Find us online:  
Southsloughestuary.org



**Psst.**  
Please  
give me  
some  
color!

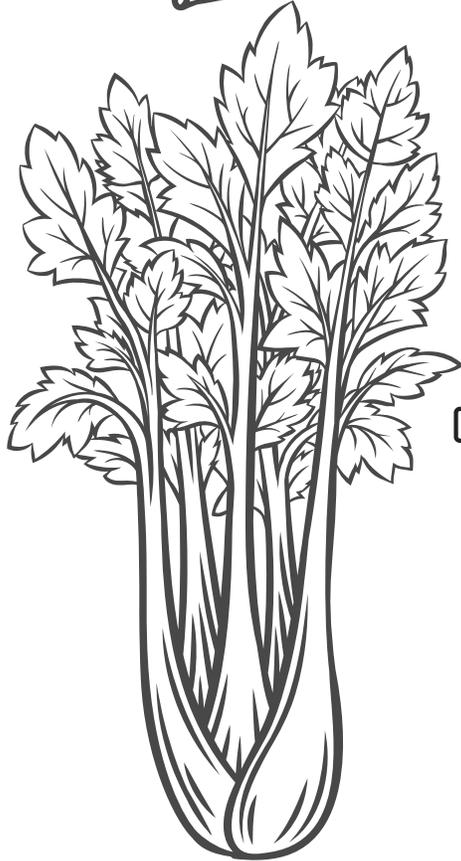
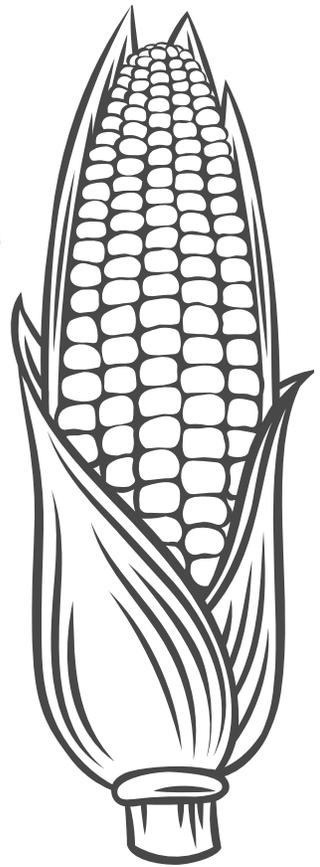
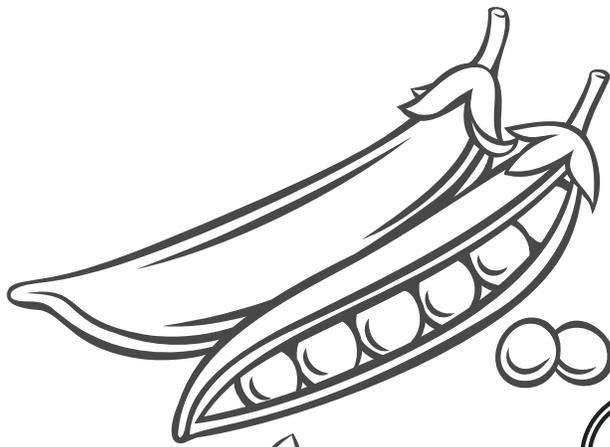


IT SAYS A LOT  
ABOUT A  
COMMUNITY  
THAT SUPPORTS  
A CO-OP!

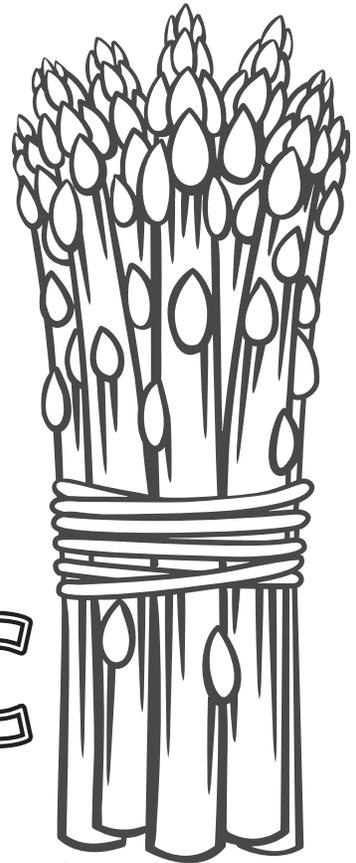


COOS HEAD  
FOOD CO-OP  
-EST. 1971-





ONCE  
 UPON A  
 TIME ALL  
 FOOD  
 WAS



ORGANIC

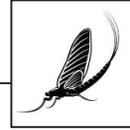


COOS HEAD  
 FOOD CO-OP  
 -EST. 1971-



## Congratulations on completing your Mayfly Festival Booklet!

*What was your favorite part of the booklet???*



**YOUR ANSWER HERE:**

*What is the coolest thing you learned?*



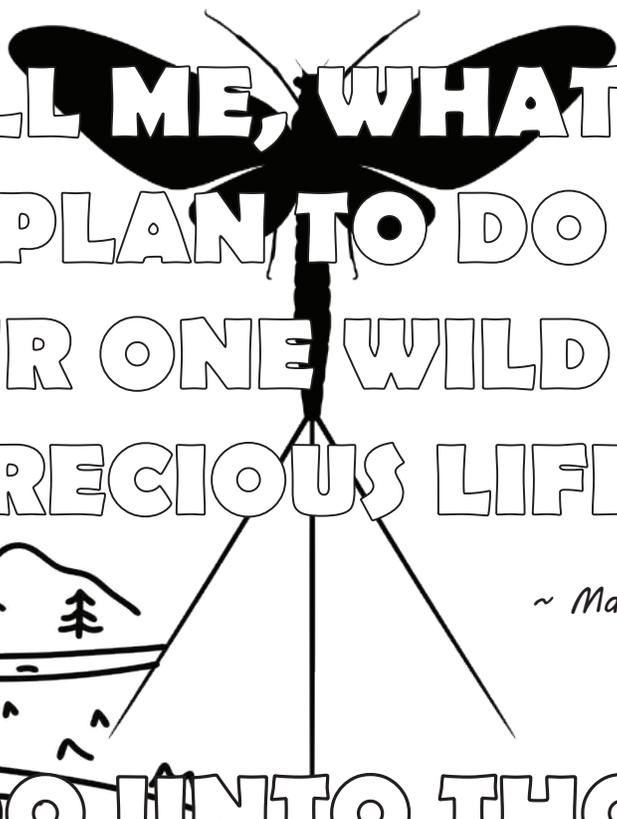
**YOUR ANSWER HERE:**

### Keep in touch!

For more info on how to help your watershed, details on volunteer opportunities, or questions on any of the topics covered in this booklet, please reach out any time! We'd love to hear from you.

[www.cooswatershed.org](http://www.cooswatershed.org); (541) 888-5922





“TELL ME, WHAT IS IT  
YOU PLAN TO DO WITH  
YOUR ONE WILD AND  
PRECIOUS LIFE?”

~ Mary Oliver



“DO UNTO THOSE  
DOWNSTREAM

AS YOU WOULD HAVE  
THOSE UPSTREAM  
DO UNTO YOU”

~ Wendell Berry