

Trinidad Rocks!

California Coastal National Monument

Junior Explorer Activity Book



NATIONAL
CONSERVATION
LANDS





Legend	
1	Trinidad Museum and Native Plant Garden
2	Trinidad Memorial Lighthouse
3	HSU Marine Lab
4	Old Home Beach
5	Trinidad Rancheria Harbor and Pier
6	Trinidad Head Trailhead
7	Trinidad Head Light Station
8	Trinidad State Park
9	Trinidad State Beach

Welcome, Junior Explorer!

BLM’s Junior Explorer program helps introduce young explorers like you to the lands and resources that the BLM manages. This activity book will introduce you to plants, animals, and history of the Trinidad Gateway to the California Coastal National Monument

Are you ready to have some fun!?

Read and complete all of the activities in this book. Feel free to have an adult help you.

Take this book to the Arcata Field Office or the Trinidad Museum after you finish so that a BLM Ranger or volunteer can check your work.

After you complete your book you will be sworn in as an official Junior Explorer and the certificate at the back of this book will be filled out and stamped.

This Activity Book Belongs To:

What is a Junior Explorer?

- Junior Explorers explore the environment around them.
- Junior Explorers care for plants, animals and the land.
- Junior Explorers encourage others to care for the land and its inhabitants.



ALL STACKED UP

Head down to the Trinidad Pier and Harbor for a closer look at the California Coastal National Monument.

The rocks you see from the pier are called Sea stacks. **Sea stacks** are blocks of erosion-resistant rock isolated from the land by sea. Sea stacks begin as part of a headland or sea cliff. Constant pounding by waves erodes the softer, weaker parts of a rock first, leaving harder, more resistant rock behind.

Erosion happens when rocks and sediments are picked up and moved to another place by ice, water, wind or gravity.



What sounds can you hear from the pier?

List the wildlife you see from the pier that use the sea stacks.



Trinidad Harbor and Pier owned and operated by the Trinidad Rancheria.

HOW DO YOU SAY CHER-AE ANYWAY?

The name comes from the coastal Yurok village at Trinidad called Chue-rey (also spelled Tsurai). In the Yurok language, “ts” or “ch” makes a hard ch- sound as in chocolate. The “ae” makes an “ay” sound as in way.

Traditionally the Yurok people subsisted on the abundant plants of the redwood forests including mushrooms, wild herbs and teas, and large game animals such as deer and elk. In addition, marine resources such as salmon, rock fish, surf fish, eels and seaweed, all caught or gathered along this ancestral coastline and contributed to their diet. Visit the Trinidad Pier and see if you can find these marine animals in the mural.



Try saying these Yurok words for local marine plants and animals.



Did you know?

When you visit the Trinidad Pier you are visiting Trinidad Rancheria land? The Trinidad Rancheria is a federally recognized tribe with ancestral ties to the Yurok, Wiyot, Tolowa, Chetco, Karuk and Hupa peoples.



If you want to find out more about the Yurok Language Project.



HONORING THOSE LOST AT SEA

After modern technology replaced the original fog bell and lens at the Trinidad Head Lighthouse in 1947, the Coast Guard donated the historic artifacts to the Trinidad Civic Club for display in a planned memorial park overlooking Trinidad Bay. In 1949 the club built a concrete Trinidad Memorial Lighthouse, an accurate replica that many visitors believe to be the actual Trinidad Head Lighthouse.

Each year on Memorial Day, friends and families gather to remember those whose names are recorded on the plaques.

DRAWING ON PAST HEROES

Use the space below to honor a life lost at sea. Take a stone rubbing of one of the names listed on the memorial plaques. Stone rubbing is the practice of creating an image of surface features of a stone on paper. By rubbing your pencil over the paper that is placed on top of the name you will begin to see a name appear!

Try rubbing a seagull next to the name.



Lighthouse Ins and Outs

Explore the Memorial Lighthouse and see if you can answer these questions.

At what time does the lighthouse bell ring each day? _____

How many pounds does the bell weigh? _____

Why is this bell here and what does it have to do with the lighthouse?



Trinidad Times

January 1, 1915

Tidal Wave Rocks the Trinidad Lighthouse

Ending the year with a weeklong treacherous gale storm and huge seas from the southwest, Fred L. Harrington, Trinidad Head Lighthouse keeper tells the story of a sneaker wave like none seen before. Keeper Harrington has served as the lighthouse keeper for 26 years. Harrington tells his story,



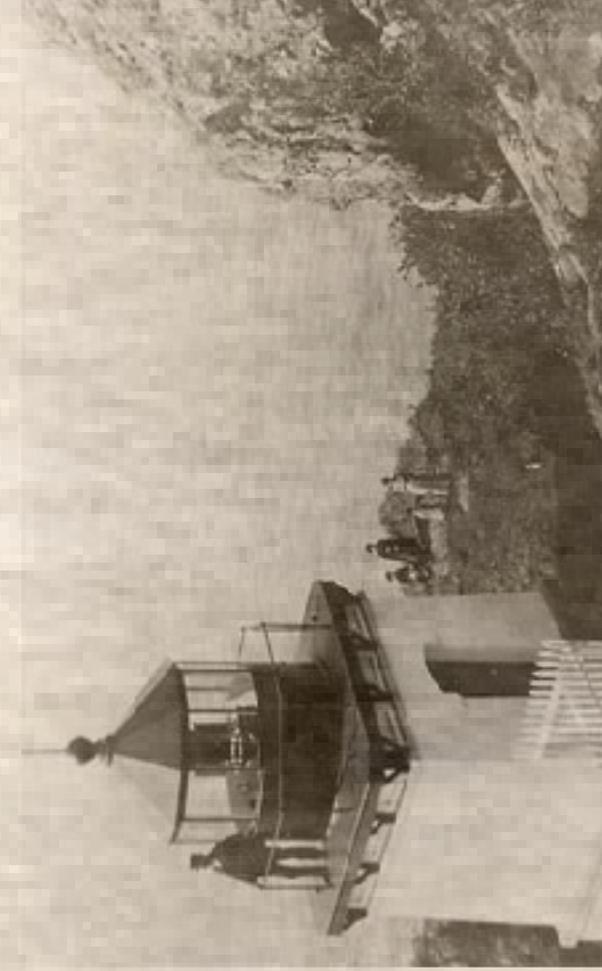
Lighthouse Keeper Harrington

“Yesterday I watched the storm wash over (93-foot-high) Pilot Rock, a half mile south of the head, something I

had not seen before. At 4:40 p.m., I was in the tower and had just set the lens in operation and turned to wipe the lantern room windows when I observed a sea of unusual height, then about 200 yards distant, approaching. I watched it as it came in. When it struck the bluff, the jar was very heavy, and the sea shot up to the face of the bluff and over it, until the solid sea seemed to me to be on a level with where I stood in the lantern. Then it commenced to recede and the spray went 25 feet or more higher. The sea itself fell over onto the top of the bluff and struck the tower on about a level with the balcony, making a terrible jar. The whole point between the tower and the bluff was buried in water. The lens immediately stopped revolving and the tower was shivering from the impact for several seconds.

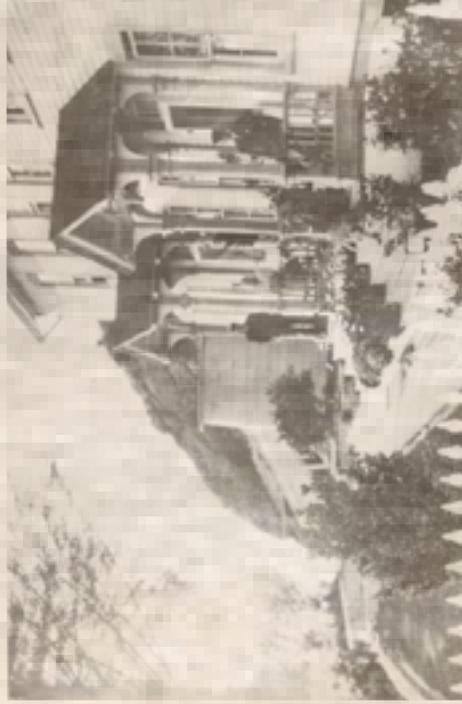


Trinidad Head Lighthouse photo taken from the Bell House



Keeper Harrington on the lighthouse with his family standing on the bluff in the background

“Whether the lens was thrown off level by the jar on the bluff, or the sea striking the tower, I could not say. Either one would have been enough. However, I had it leveled and running in half an hour. During the 26 years that I have been stationed here, there has at no time been a sea of any such size as that of the 31st experienced here: but once during that time have I known the spray to come onto the bluff in front of the tower, and but twice have I seen sea or spray go over Pilot Rock.”



Trinidad Head Lighthouse living quarters



Trinidad Head Lighthouse

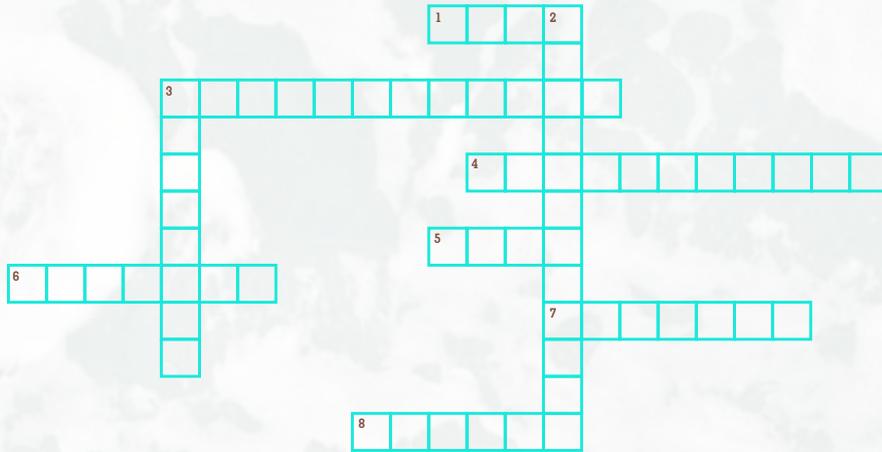
WATER SAFETY SMARTS

Staying Safe in the Surf

 Humboldt County has some of the most beautiful and fun beaches on the North Coast. To enjoy our beaches safely you have got to respect and understand their raw power. Show what you know with this puzzler:

WORDS

Tsunami
steep beaches
dogs
sand cave
sneaker waves
rip currents
call 911
tide
cliffs



Across

- _____ that are pulled into the surf have an easier time getting out than their human rescuers. Wait for them to swim back to shore on dry land.
- Avoid turning your back to the ocean. It can look calm for 15 or more minutes before a few really big _____ hit without warning.
- Humboldt County has _____, which are strong outgoing currents that can pull you into deep water if you get caught in one.
- A rising _____ can change the water level nine feet on beaches in Humboldt County in only six hours!
- If you're at the beach and feel an earthquake, quickly go to higher ground away from the coast because a _____ could be headed your way.

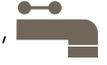
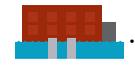
- Don't go into the water after a person who gets pulled into the surf. _____ and be prepared to guide rescuers to the person in trouble.
- High steep _____ can collapse under your feet and cause you to slip. Humboldt County has crazy geology that results in _____ that are just waiting to fall apart under your weight.

Down

- Choose your beach well. _____ are dangerous because ocean waves can reach much farther up the beach and pull you into the surf. Flatter beaches are much better choices.
- Be careful digging holes, sand is very unpredictable. The walls of a _____ or hole can suddenly collapse without warning.

WHAT IS STORMWATER RUNOFF?

Ever wonder where rain  goes when it storms? 

In most of Humboldt County water that comes from our sinks, , bathtubs, and washing machines  is carried through pipes to the waste water treatment plant .

The dirty water at the plant is cleaned through a complex system. But water that washes over streets , lawns , and parking lots when it rains flows directly into creeks, rivers, our bays and ocean. 

Storm water can pollute  because it is never cleaned and picks up  everything in it's path. Storm water can carry things like soil, yard waste , animal waste , used oil and fertilizers. Trash that falls out of your pocket or backpack, is blown out of trucks , or dropped on the ground all ends up in the ocean. Remember the 3 R's, Reduce, Reuse and Recycle .

Three great ways YOU can eliminate waste and protect your environment! Keep our ocean clean!



Start

Stormwater Board Game

(requires two players)

SCOREBOARD

Player 1

(Keep track of your points here. Example: IIII+ III-)

Player 2

(Keep track of your points here. Example: IIII+ III-)



Directions

- Find a friend
- Ask your parents for 3 pennies – one person is heads, one person is tails
- Flip the 3rd penny. Heads is move ahead 1, Tails is move ahead 2.
- When you land on a + add a point. When you land on a - subtract a point. For each plus and minus explain why each action would harm or help the ocean and rivers.
- Travel through the game 2 times
- Winner is the person with the most points who travels through the game 2 times, and correctly explains the + and - actions to an adult.



TALE OF TWO FORESTS

You may have noticed the lush coastal spruce forests in Trinidad. As you explore the trails in Trinidad, it's easy to see how important the forest is to its inhabitants as a home: squirrels, birds, bugs, even people! But, how many of us have actually explored an underwater forest? Instead of trees, bushes, and mosses, Trinidad Bay's underwater forests are composed of different types of algae and kelp that are just as important as homes for underwater creatures.



KELP VS. SPRUCE

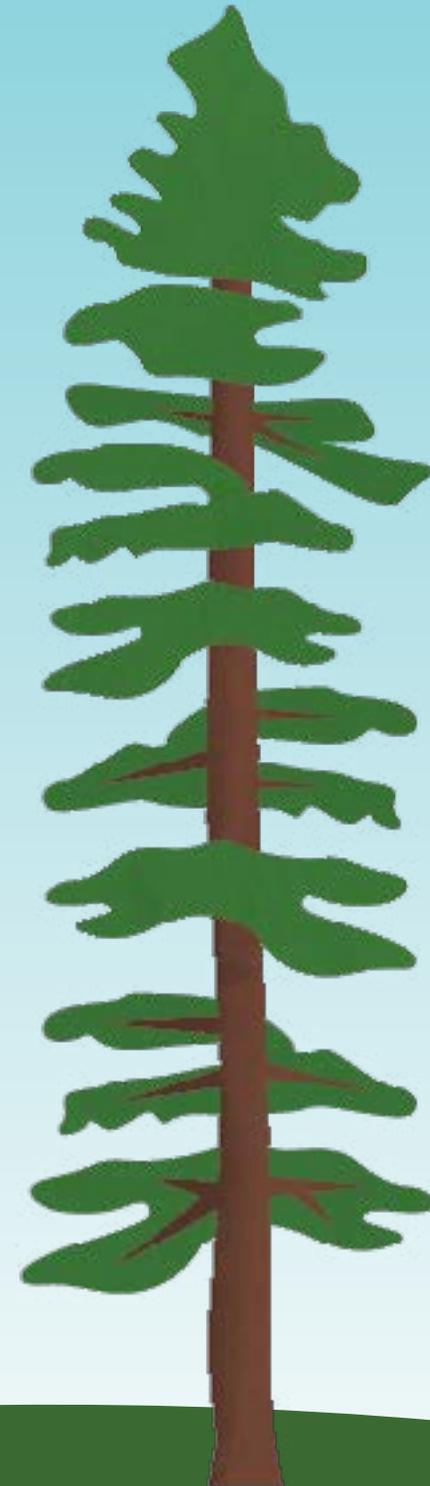
The structure of kelp can be compared somewhat to that of plants: they include a **holdfast**, a **stipe**, **pneumatocysts**, and **fronds**.

- 1** The **holdfast** of kelp is similar to the roots of a spruce tree because it attaches the kelp to the surrounding environment, like rocks. Unlike roots, the holdfast does not funnel water and nutrients to the rest of the kelp.
- 2** Like a spruce tree trunk, the kelp **stipe** allows it to reach up high to absorb sunlight. Kelp and spruce use the sun to make food in the process of **photosynthesis**, just like plants. The stipe is hollow and filled with air, so that it can float to the surface of the water to reach the sun's rays.
- 3** In addition to having a hollow stipe, kelp often has **pneumatocysts** (pneu=air/cyst=ball), which are like balloons that hold the kelp up to the ocean surface allowing it to get more sunlight. Spruce trees are more solid and do not need pneumatocysts.
- 4** **Fronds** of the kelp are similar to leaves as they collect sunlight for photosynthesis. Fronds also release spores, the kelp equivalent of seeds.



What do a kelp forest and a Sitka spruce forest have in common?

How are they different?



KELP IN YOUR KITCHEN

Take a look at the ingredients list of things you eat or use daily at home. Do you find any agars, carrageenans or alginates listed on your ice cream or yogurt containers? Those are food additives made from kelp that help to stabilize, thicken or gel certain foods.

Ice cream isn't the only place you'll find kelp in your kitchen. Other items containing agar or carrageenan include salad dressing and jelly. You might also find it in your toothpaste — never thought you'd be brushing your teeth with seaweed, did you?

Circle the items you think have kelp in them ▶

Q: Where does seaweed look for a job?
A: In the 'Kelp-wanted' ads

You Get Paid To Do This? CAREER PROFILE

Stephanie Strasser
 Hands on the Land Teacher
 Trinidad School
 CCNM, Trinidad, CA



Tagging a turtle in Hawaii

WHAT SHE DOES

My favorite part about teaching is sharing my love for the ocean and the animals that reside there. Nudibranchs are my favorite tidepool animal. I find them incredibly beautiful, fascinating, flashy, whimsical, graceful and toxic. My goal as a teacher is to have every student who graduates from our school know and appreciate the life of a nudibranch. Our school is steps away from the California Coastal National Monument and I use public land as my outdoor classroom as much as possible.

EDUCATION

I graduated from Humboldt State University with degrees in Marine Biology and Zoology. Before finishing my degree I took time off to explore the world and travelled to Guam, Hawaii, Japan and New Zealand. On my travels I enjoyed surfing and diving wherever possible and found this amazing life under the ocean that I never knew existed. I saw all of these animals going about their daily life unbeknownst to the world above them. This underwater world inspired me to attend Hilo University, on the Big Island of Hawaii, as an exchange student. While there I dove for turtles to tag and measure them for fibropapillomas (tumors) to help with research. When I came back I landed a job with the Natural History Museum in Arcata teaching kids about science. Once I realized I could inspire students to love and care for the ocean I was hooked. I went back to school and earned my teaching credential so I could share my love of nudibranchs (and all of the other ocean critters!) with my students.



Tidepooling with my students on the CCNM.

SOMETHING TO THINK ABOUT

Teaching is an art. Every connection is unique. You are responsible for another person's education, a social worker, a replacement mom, a classroom manager, a confidant and a friend all in one. I hope to connect and inspire my students to make a difference in our world.



Sea Clown Nudibranch



NATURAL HISTORY MYSTERY

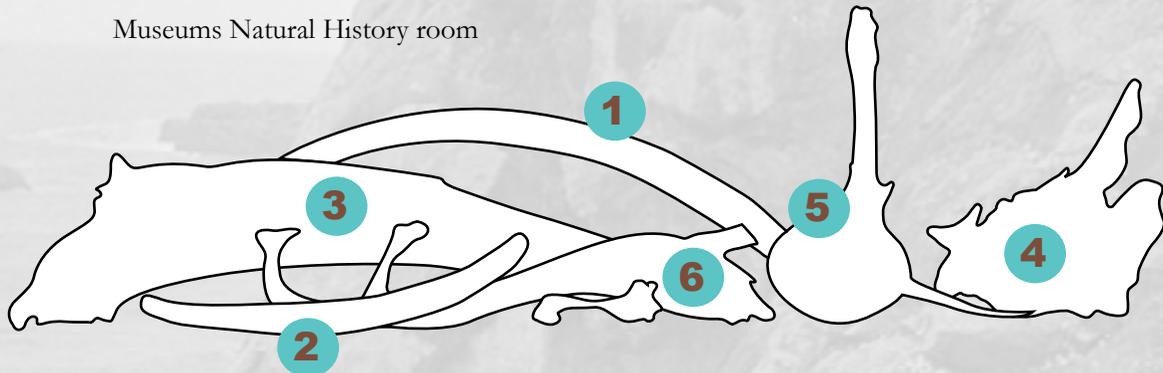
Explore Trinidad's rich cultural and natural history at the Trinidad Museum. Follow the native animal footprints to the front door of the newly renovated Victorian Italianate bungalow, which is now the Trinidad Museum.

The museum has five exhibit rooms which emphasize the original Tsurai Village, Yurok traditions, European contact, the Gold Rush, whaling, fishing, shipping, logging, and the Trinidad Head lighthouse. All this within a building that is an exhibit in itself!



Name The Whale Bones

Hint: answers can be found in the Trinidad Museums Natural History room



- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | 6. _____ |



What animal made this hole?

Hint: look for rocks in the natural History room.



NATIVE PLANT GARDEN

Hidden behind the Trinidad Museum are several habitats for you to explore. Walk the short trail and take a glimpse inside a woodland, coastal meadow and a wetland.

Did you know that the Native Plant Garden behind the Trinidad Museum is a National Phenology Network site? Phenology is a big word for keeping track of the seasonal changes in plants and

animals from year to year. By observing and inputting your observations into the National Phenology Network database you are helping scientists discover changes in plants and animals and their timing and relationship with weather and climate.

When studying plants and animals biologists record what they see. **Document what you see and answer the questions below.**



Date: _____

Time: _____

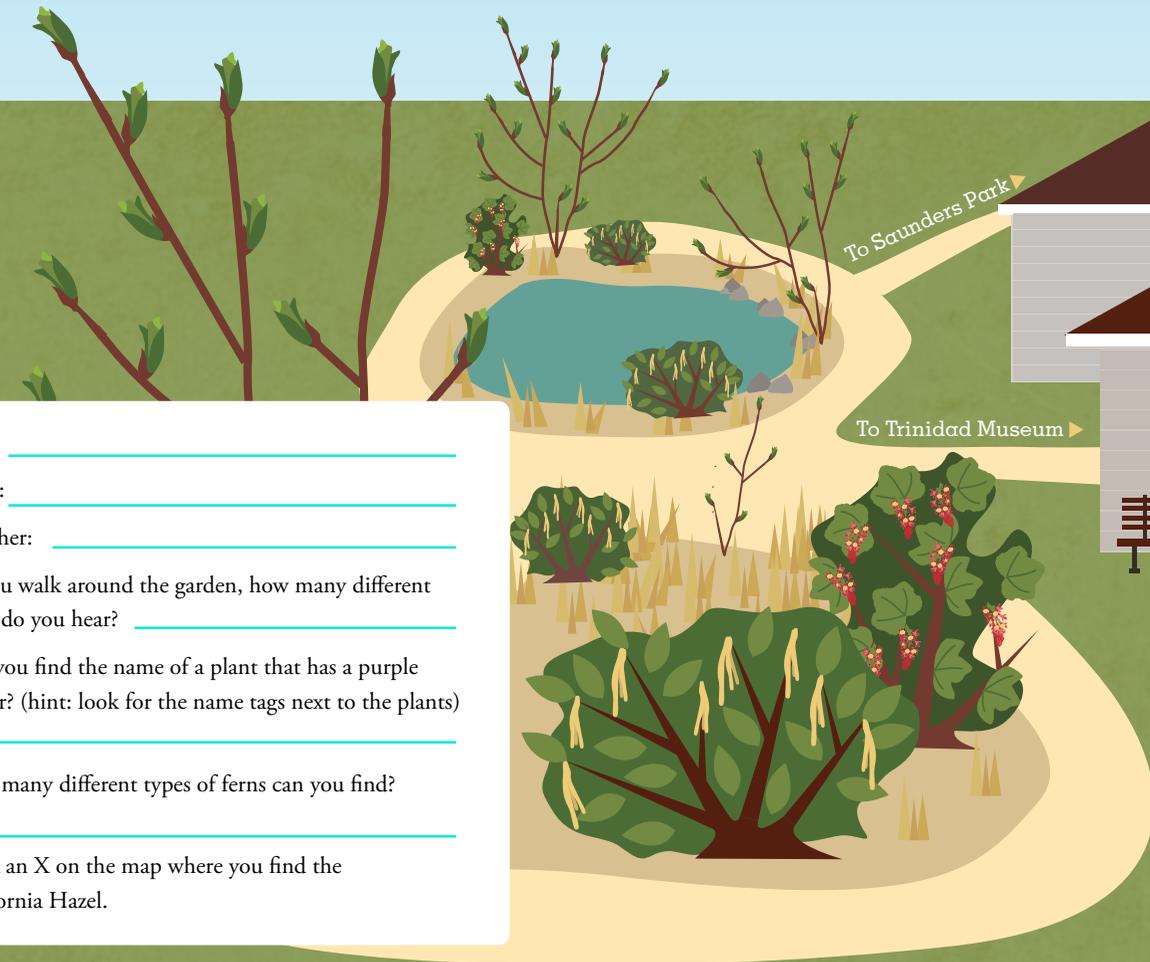
Weather: _____

As you walk around the garden, how many different birds do you hear? _____

Can you find the name of a plant that has a purple flower? (hint: look for the name tags next to the plants)

How many different types of ferns can you find?

Mark an X on the map where you find the California Hazel.



CLIMATE CHAMPION



Find these plants in the garden and look for the tag...



indian plum, osoberry
(*Oemleria cerasiformis*)



wavyleaf siltassel
(*Garrya elliptica*)



wax current
(*Ribes sanguineum*)

Researchers, resource managers, educators and others use your data for scientific discovery and decision-making. Your data collection is important!

Phenology data help us predict threats to people and the environment such as wildfires, drought or flooding. They help us decide the timing of events, from when to harvest or irrigate land to when to conduct controlled burns in forests.



First, become an observer on the National Phenology Network website. Then select the BLM Arcata Field Office, Trinidad Museum site.
bit.ly/ljCDlma



Then you can download the Natures Notebook iPhone App and begin observing!
bit.ly/lmvzmzOP

VISIT TSURAI

On your visit to the Trinidad Museum, check out the diorama of the Tsurai village and see if you can fill in the names of the people who once lived in these houses.



YUROK CANOE

A large part of the Yurok culture is centered along the water's edge, and ancestral villages are concentrated along the coast and Klamath River. Tsurai, meaning mountain, is the southernmost permanent village within Yurok territory. The village domain extends north from Trinidad Head (Tsurewa) to Beach Creek (O prmrgr wroi) several miles up the coast, and south to Little

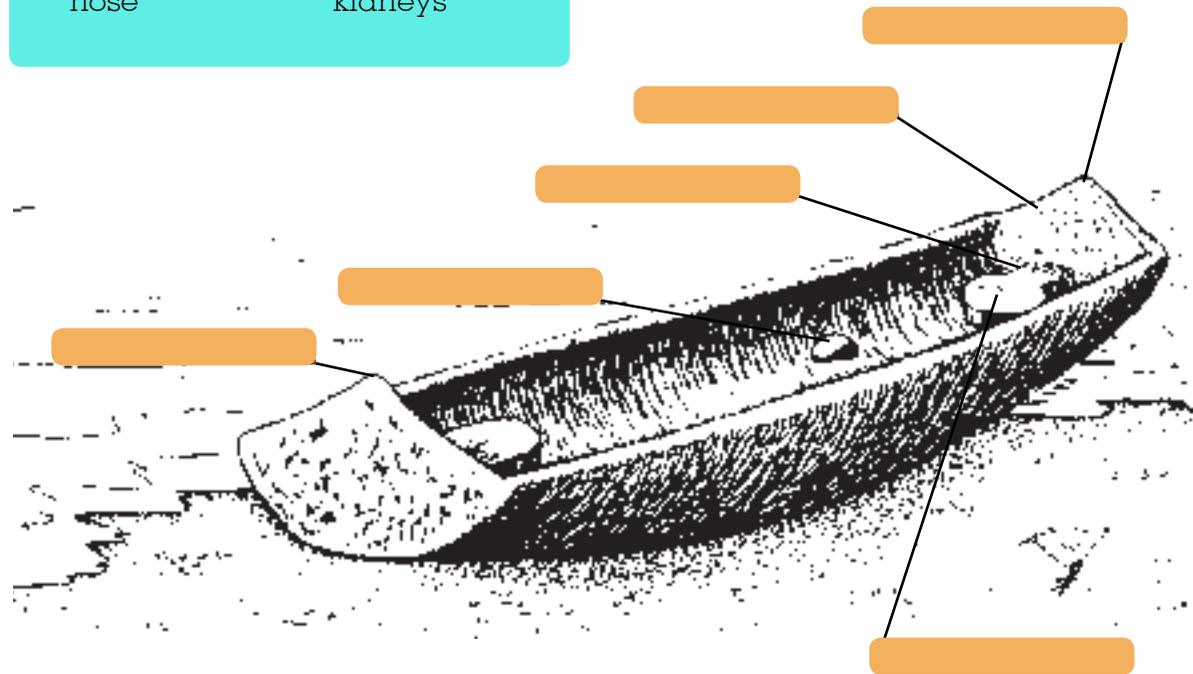
River (Me'tsko or Srepor). Just as in the past, the Tsurai Village, Tsurewa, and the offshore rocks continue to be components of the Yurok cultural landscape embedded with deep cultural, historical, and spiritual significance to the Tsurais of the Yurok people. The canoe is a symbol of life and is important to the Yurok people for travel, food gathering, and religious ceremonies.

CANOE PARTS

- bow
- stern
- nose
- heart
- ribs
- kidneys

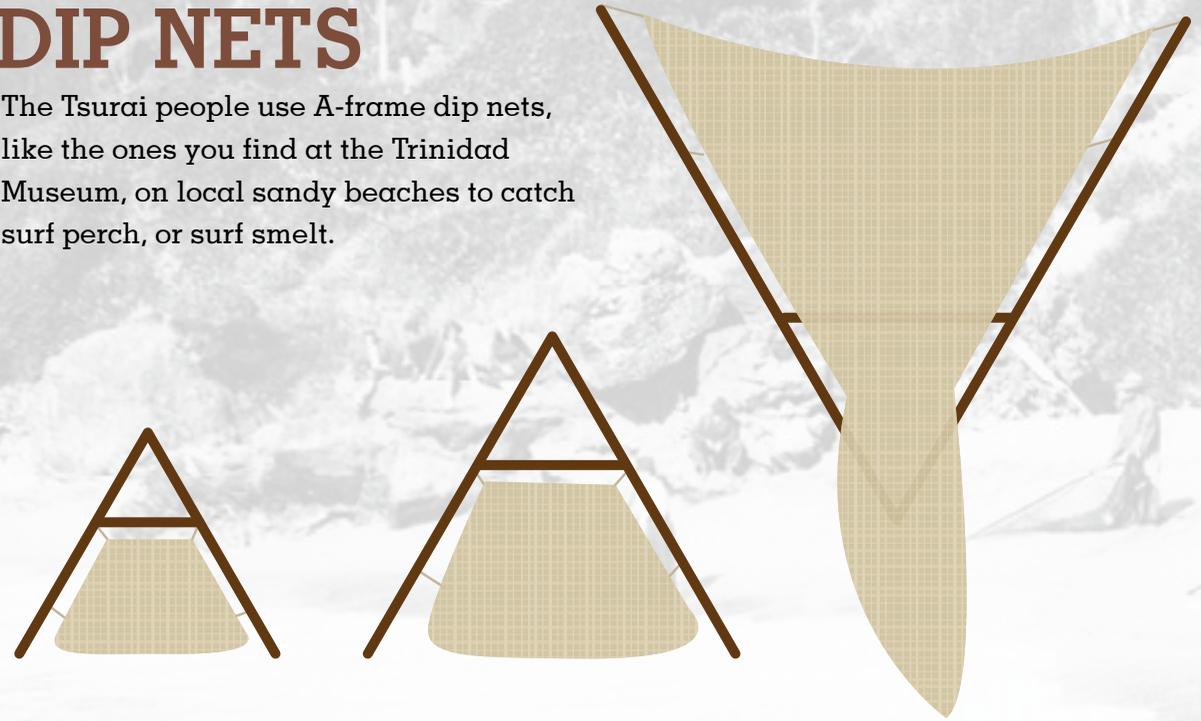


Yurok canoes are carved from a single log of a redwood. Visit the canoe at the Trinidad Museum and fill the names of each part of the canoe.



DIP NETS

The Tsurai people use A-frame dip nets, like the ones you find at the Trinidad Museum, on local sandy beaches to catch surf perch, or surf smelt.



Did you see the dip nets? Which size do you think you would use?

Where did the Yurok use these dip nets?

(hint: look at photos next to dip nets at the Trinidad Museum)



WANTED

DEAD, NOT ALIVE



On their home turf, plant and animal populations are kept in check by natural controls, like predators and food supply. However, when a species is introduced — accidentally or intentionally — into a new landscape that is not used to its presence, the consequences can be devastating. Most of these “non-native” species do not misbehave. But some non-native species spread unchecked by the lack of natural competitors and predators. They push out native species and cause ecological chaos. These are known as “invasive” species.

Originally from Europe, English ivy is a highly invasive exotic plant first introduced to Humboldt County with European settlement. As English ivy spreads, it alters natural ecosystems, quickly crowding out native vegetation on the forest floor. The ivy grows up trees weighing down branches and may eventually kill the tree.

Infestations can reduce recreational opportunities, such as hiking, bird watching, and wildflower viewing. Without treatment, English ivy will continue to flourish resulting in loss of habitat for native species. Find out how you can help be a part of the ‘No Ivy League’,



www.invasivespeciesinfo.gov



WEEDY WIDGET

English Ivy
photos: Meredith Leigh Collins

Holly (5)

Butterfly Bush (14)

Knotweed (8)

Cotoneaster
photo: D H Wright

Heath (5)

Broom
photo: Andy Roberts

Himalayan Blackberry (19)

Tower of Jewels (13)

Pampas Grass
photo: Tom Kelly

Where did the English ivy search to find out more about French broom?

How do you get to the roots of the matter?

The Encyclopediia.

Get a grip and pull them out!

On a hollyday!

How did English holly come to Trinidad?

What is spotted but doesn't spread?

A reported patch of invasive plants.

Stick to the trails and make plant invasion fail.

Knock, knock, who's there? Stick. Stick Who?

Foxglove (8)

Periwinkle (10)

Folding Instructions

1. Cut along the dotted line.
2. Place Weedy Widget this side down (side with the most writing).
3. Fold each corner to the center so that you have a smaller square.
4. Turn the folded square over and fold each corner to the center again.
5. Fold this square in half to crease it. Undo that fold and fold in half the other way.
6. Using both hands, place your thumbs and index fingers under the flaps.

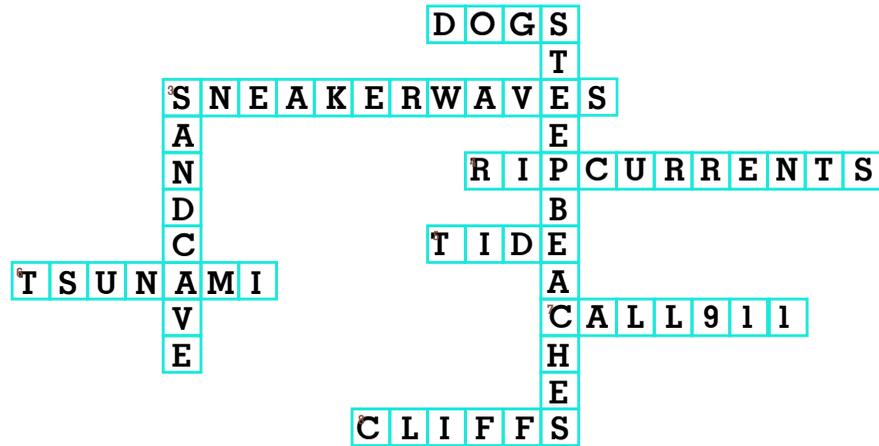
How to Play:

1. This game is for two players. Ask the other player to pick an invasive plant, like 'English Ivy.'
2. Open and close the Weedy Widget in an alternating direction for each letter of the phrase (ex. E N G L I S H I V Y (10 times.)
3. Ask the question under the chosen topic and let the other player answer. Lift the flap to find the answer.



ANSWER KEY

WATER SAFETY SMARTS



HELPFUL KELP

All items in the cupboard have kelp in them!

SEABIRD CHALLENGE QUIZ

1. eggs to fall
2. they may abandon their nest
3. true
4. true
5. false

HOW DO YOU SAY CHER-AE ANYWAY?

salmon - ney-puey
 ling cod - lo-tuen
 surf smelt - hehl-kues-leg
 crab - ko'-ses
 kelp - paa-moh
 sea star - ko-yaakw'
 mussels - pee-'eeh

TALE OF TWO FOREST

Same

Spruce and kelp forests both photosynthesize, provide habitat for many animals, withstand the salty ocean environment and grow in multiples called forests.

Differences

Kelp has air bladders, Spruce roots transport water and nutrients. Kelp holdfast does not carry nutrients, only works as an anchor.

WHALE BONES

Whale bones: 1. Rib bone, 2. Jaw bone, 3. Whale skull, 4. Whale skull, 5. Whale vertebra, 6. Jaw bone

READY **FOR** MORE?

- 1 Pick up a CCNM map and head out for a hike around Trinidad Head.
- 2 Visit the HSU Marine Lab and see if you can find Elvira, the wolf eel or touch a sea star in the touch tank.
- 3 Find other public lands to explore in Humboldt County by visiting: redwood-edventures.org/
- 4 Pick up the Headwaters Forest Reserve and King Range National Conservation Area. Junior Explorer Activity Books at the BLM Arcata Field Office or the King Range Project Office. Once you complete all three books, bring them back to one of the offices and receive a poster, pin or Jr. Explorer badge!

COLLECT ALL 3!



More Places in California TO EXPLORE

- Carrizo Plain National Monument
- Fort Ord National Monument
- Santa Rosa and San Jacinto Mountains National Monument
- Piedras Blancas Light Station Outstanding Natural Area
- Headwaters Forest Reserve
- King Range National Conservation Area



Use your smart phone to scan the QR code and find out more about Redwood Edventures!



