

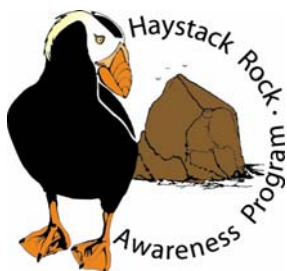
Educator's Guide For Field Trips to Haystack Rock

Grades 6 & up

The Haystack Rock Awareness Program

A program of

The City of Cannon Beach



Last updated 1/28/2010



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About the Program:

The Haystack Rock Awareness Program (HRAP) is an environmental education program of the City of Cannon Beach. HRAP's mission is to promote stewardship, through education, of the Marine Garden and National Wildlife Refuge at Haystack Rock. The program provides trained staff and volunteer natural history interpreters during spring through fall to educate visitors about the rocky intertidal and nesting seabird areas. In addition, HRAP coordinates field trips with visiting groups during this time. Groups are scheduled to spread out the impact and crowding of this intensely visited area. This provides a more enjoyable experience for students and helps prevent damage to the fragile Marine Garden ecosystem. If you would like to schedule a trip, please read the *Scheduling Tips* section which gives directions for scheduling and contact information for the Program Coordinator. If you have already scheduled your trip, we look forward to seeing you on the beach! More information on our program can be found at our website:

<http://www.ci.cannon-beach.or.us/%7ENatural/HRAP/hrap-program.html>

About Field Trips:

HRAP schedules field trips at the rock an hour before low tide and at low tide. Field trips run approximately an hour so we can accommodate as many groups as possible during the low tide. Please arrive a few minutes before your scheduled time so you can get the maximum time possible in the intertidal area. Also please come prepared with students divided into 4 groups with chaperones with each group.

HRAP will set up 3-4 stations for students at Haystack Rock:

1-2 Intertidal stations: We typically have one intertidal station on the north side and one intertidal station on the south side of the rock. Each station will focus on different aspects of the intertidal habitat. At times, only a single intertidal station will be available due to tide, weather, or ephemeral deep water channels that may prevent access to some areas.

1-2 Bird viewing stations: A bird viewing station will be set up on the north or south side of the rock to view nesting seabirds. We may set up two bird viewing stations to provide views of different species and habitats (e.g. Tufted Puffins on the north side and Black Oystercatchers on the south side).

1 Aquaria station: In addition, HRAP has a temporary collection permit which allows us to set up aquaria tanks at tables in front of the Marine Garden. Aquaria, microscopes or stereoscopes will be set up to give students a closer view of intertidal animals. Animals will later be returned to their intertidal homes.

Please see the *Study Ideas* section for a more detailed discussion of the field trip. A classroom introduction to the marine environment before your trip will greatly enhance the student's learning experience. The more specific the activities or study focus, the

better. Students will learn relatively little from a vague assignment, such as “head out and find as many different creatures as you can”. With such an assignment, students are more likely to get injured rushing from place to place to find animals and are more likely to damage the intertidal areas in the process.

About Haystack Rock:

Haystack Rock is a protected Marine Garden and is part of the Oregon Islands National Wildlife Refuge. Everything above the high tide line (upper barnacle line) at Haystack Rock is part of the Oregon Islands National Wildlife Refuge and is closed to public access to protect wildlife. Everything below the high tide line is a state-protected Marine Garden, set aside for wildlife habitat preservation and public education. Collecting, climbing, and harassment are prohibited by these designations.

More information about the Oregon Islands National Wildlife Refuge can be found at:

<http://www.fws.gov/oregoncoast/oregonislands/>

To the Teacher:

Volunteers and staff of the Haystack Rock Awareness Program designed this intertidal ecology unit for school groups who visit Haystack Rock. It is intended to facilitate a basic understanding of the intertidal animals, nesting seabirds, and the associated habitats at Haystack Rock. A donation of \$1-2 per student is suggested to support the continuation and improvement of our program. This is a work in progress and your input is greatly appreciated.



Preparing for Your Trip: Scheduling, Beach Safety & Stewardship

Exploring tide pool areas is fun, but adequate planning is essential. Waves crash and smash against the rough and rocky shore. Wind blows, sun shines and rain...well, rains. Planning ahead will make the trip rewarding and safe for your class.

Scheduling Tips:

1. Check a tide schedule- There are roughly two lows and two highs each day. Tides of 0.0 feet and lower are better for tidepool viewing at Haystack Rock. When the ocean is calm, many intertidal areas can still be viewed at plus 1 to 2 foot tides, but a calm ocean is not predictable. Understand that tide books reflect an educated guess and the weather can affect the accuracy of the information. The tide table booklet most adequate for the low tides at Haystack Rock is the Pacific Beaches tide table. Pacific Beaches tide tables are available at many coastal businesses and visitor facilities. On the web, visit the NOAA website for tide predictions at: www.tidesandcurrents.noaa.gov. The Columbia River entrance reference station is the most accurate for low tide predictions at Haystack Rock. To access this reference station's predictions from the home page select: "Products" in the middle of page, select predictions and year of interest. At the "Water Level Tidal Predictions" page, click on "Oregon" at left of page, select "Columbia River" and then click on the "predictions" link for the "Columbia River entrance (N. Jetty)" reference station.

2. Identify dates with appropriate tides -Try to plan your visit an hour before low tide or at low tide. An hour before is preferred as this will give you time to explore while the water is still receding. Remember, weather conditions like big surf and strong winds can GREATLY affect both the level of the tide and the speed with which it comes in. **Remember to arrive at least a half hour before your beach start time. This will allow time to get organized, have restroom breaks and walk to Haystack Rock.**

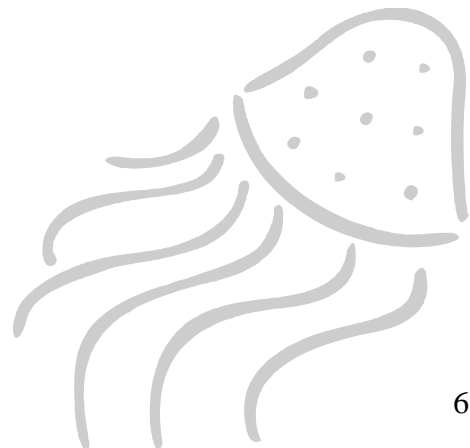
3. To schedule a trip with the Haystack Rock Awareness Program, please call or e-mail the Program Coordinator at 503-436-8060 or cardillo@ci.cannon-beach.or.us. Scheduling begins as early as December for spring field trips. Please try to schedule your trip at least two months in advance before the low tide dates are fully booked. Identify alternative dates in case your date of choice is already filled.

4. Adult supervision is important for safety and to ensure a high quality experience- Recommended adult:student ratios are 1:4 for ages 8 and under; 1:6 for ages 9 to 12; and 1:8 for ages 13 to 18. This makes it easier for the students to focus on the planned activity and questions can be responded to more easily.

Beach Safety Tips:

Our rocky shores are rough, wet places home to both animals and plants. While they are fun places to explore, safety precautions are a must. Rocks are slippery, the ocean is dangerous, and sneaker waves are a common occurrence. In addition, rocky shores are homes for animals and plants not well adapted to our feet and hands. Remember the following guidelines to ensure a safe trip to the tidepools for you and for the animals and plants that live there.

- 1. Keep an eye on the ocean** – Large wave surges, or sneaker waves, can knock any person off their feet without warning! Sneaker waves are not predictable, but if you remember to never turn your back on the ocean you will be able to see when large waves are coming and move to a safe area.
- 2. Use caution** – Running, jumping, or playing around in tide pool areas is unsafe for you and for the animals that live there. Rocks that are covered with wet algae and animals are slippery. Some animals and rocks are sharp. The combination of slippery and sharp has resulted in many injuries in tide pool areas, so please walk in intertidal areas! (See the *Stewardship* section for avoiding stepping on plants and animals).
- 3. Check your tide table** – Know when the tide is coming in so you can watch for rising water. And realize that the time is only a prediction and the weather can affect the accuracy of the information.
- 4. Be ready to get wet** – Wearing proper shoes allows you to avoid rock hopping, which is safer for you and the animals and plants that live on rocks. Wear layered clothing for unpredictable weather changes and bring a rain jacket. If you are traveling a long distance a change of clothes is a good idea just in case you get wet.
- 5. Please do not play on driftwood** – It only takes four inches of water to move a five-ton log!
- 6. Please don't allow children to play in the water without adult supervision.** Undercurrents and rip tides can pull children far away from shore. Ask a life guard where there are known rip currents and keep an eye on kids to make sure they do not go out too deep, or play in unsafe areas.



Stewardship:

Intertidal areas are fragile ecosystems. Activities such as trampling, turning over rocks, and removing animals from their habitat can greatly damage the tide pool life. Yet we can all enjoy tide pool areas and ensure their survival by following a few simple rules.

Listed below are rules that help ensure the preservation of the Marine Garden and wildlife refuge for future visits. Thank you for helping us to be responsible stewards by following these guidelines.

1. Tread Lightly – Always stay on bare sand or small bare rock. It can be tricky to navigate tidepool areas without stepping on live animals. Please follow these tips to help minimize human impact on this fragile area:

- a. Walk slowly, and look where you place your feet. Animals in the intertidal areas are often small and camouflaged.
- b. Learn to recognize barnacles, mussels, anemones, algae, snails and other creatures so you can avoid stepping on them. Teach the students what to watch out for when walking in the area.
- c. Please follow the instructed routes between stations and please note that we ask groups to walk around cobbles in front of rock and not through them. If the tide is low enough this shouldn't be a problem. Please ask an interpreter for directions on how to get to stations if you don't know or if the tide is too high for you to avoid walking through rocks.
- d. Stay out of tidepools. Small puddles are hard to avoid, but walk around large pools please.
- e. Wear boots that you can get wet. This helps prevent rock hopping when the tide starts to move in.
- f. Avoid stepping on seaweed and algae-they provide food and hiding places for animals, and can be very slippery.

2. Explore Gently:

- a. Use eyes more than hands and leave animals in their homes.
- b. Do not poke, pry, rip or take animals or plants off rocks. These acts are guaranteed to kill or seriously injure animals.
- c. Even though it's fun to look, do not turn over rocks. You can accidentally crush animals and kill them when turning over and replacing rocks. For an alternative activity, if looking for crabs, observe them with your eyes hiding in mussel beds. Ask an interpreter to help you.

3. Collecting is Prohibited at Haystack Rock– The tidepool area at Haystack Rock is a protected Marine Garden; this means everything in it is protected from collection and harassment. Animals and plants are alive; dead material and shells are recycled and reused; so, take only memories and pictures. Collecting is prohibited and punishable by law.

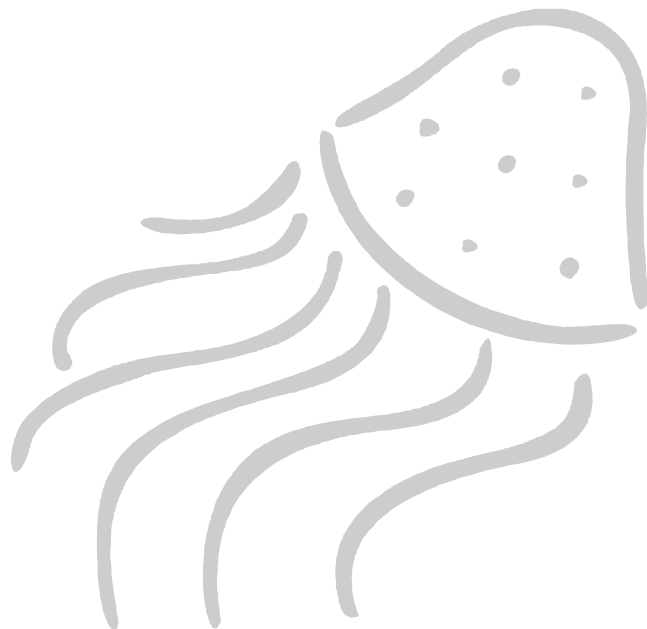
4. Climbing is Prohibited at Haystack Rock and all off shore rocks on the Oregon Coast. People easily disturb marine birds that nest on offshore rocks and marine mammals that haul out on these rocks. Birds will abandon their eggs and nests if people get too close which leaves eggs and chicks vulnerable to predators and to the weather! Marine mammals use the rocks as valuable resting areas. So, please remember climbing is prohibited above the high tide line at Haystack Rock and all offshore rocks along the Oregon Coast and punishable by law.

5. What to bring - Having the right equipment and clothing are essential to a successful field trip. Wear shoes that you expect to get wet and layered clothing that adapts to weather changes. Rain and wind are common all year round on the north Oregon coast, regardless of what the weather report may state or how the weather is when you get off the bus. A few steps on the beach and the wind may be howling. The following is a list of recommended gear:

- a. Rain coat and pants or clothes you can get wet
- b. Rubber boots or shoes you can get wet
- c. Lots of layers, at least 4 top layers on windy/cold days
- d. Change of clothes – water happens!
- e. Lunch or snacks
- f. Water
- g. Sun block
- h. Sunglasses or hat
- i. Identification guides
- j. A camera
- k. Your questions

6. What Not to bring to Haystack Rock - Please help us keep our impacts to a minimum at Haystack Rock by not bringing the following items:

- a. Observation equipment: including buckets, nets, aquaria, plastic bags, etc.
- b. Sticks
- c. Shovels
- d. Kites



Study Ideas: Pre-visit, visit, and post-visit curriculum ideas

Note to Teachers: Below are suggested study areas and associated activities. Please communicate to the Program Coordinator if you would like to change the field trip station emphasis. We will try to accommodate your needs, if possible. If the field trip involves work sheets, teachers are responsible for preparing them for the trip ahead of time.

Pre or Post Study ideas:

Have students work in groups to answer questions or do activities from the following list:

1. What characteristics make a tidepool? Show pictures if pre- or post-visit activity.
2. Describe plant and animal diversity observed in a single tidepool.
3. What causes tides, and how do they change throughout the day, month, and year?
4. Why is tidepool etiquette important?
5. Make a list of changes that tidepool animals deal with on a daily and seasonal basis. How are these animals adapted to their changing environment?
6. What is zonation? Can you identify zones based on differences in species present as you get further from shore?
7. Why are there more animals living in the rocky beaches than sandy ones? Can you name animals that live at sandy beaches?
8. What are some of the things intertidal animals compete for?

Have students pick an animal and answer the following questions:

1. Where does the animal live (which zone) and why do you think it lives there?
2. How does the animal move (if it moves)?
3. How does it protect itself from predators, waves, etc?
4. How and what does it eat?

During your visit:

While in the intertidal areas:

1. Describe the animals and plants that you see.
2. If you see any animals in shells, describe or name them.
3. What are the main colors that you see? What is their significance?
4. Do you see any animals eating? What are they eating and how do they forage?
5. Do you see any animals that look like plants? What are they?
6. Do you see any animals that are sessile? Mobile?

Research Project: Observe visitors in the tidepools for a set period of time (5-10 minutes). Write a short paragraph on how visitors conducted themselves. Did you notice anyone pulling animals off rocks or overturning rocks, etc.? Did you notice anyone walking carefully to avoid crushing plants and animals?

Adaptation: Adaptations are the tools that enable plants and animals to survive successfully in their environment. Pick an animal and tell how it is adapted to different aspects of their environment, such as avoiding predators, finding food, surviving exposure, or dealing with wave action.

Beach Walk: While exploring the beach, look for natural and human-made objects and try to figure how and where they came from. About how long would they remain on the beach or in the ocean before they biodegrade?

Remove Hazards from the Beach: You can help the animals that live along the coast by removing human made garbage such as plastic, fishing lines, and other litter you might find. Help keep our beaches clean and safe. Picking up litter on the beach can be an assignment or something used as extra credit. Do not pick up litter that appears hazardous. Instead notify an HRAP Interpreter. Thank you!

Field Trip Stations & Activities

Please allow an hour for your field trip. Groups larger than 100 people will need at least 1.5 hours. If you need to arrive early we ask that you stay out of intertidal areas until your start time. Students will be divided into groups of 25 or fewer which will rotate stations every 15 minutes. Rotating groups allows a more interactive guided experience with HRAP staff and volunteers. Let us know if you have other ideas for how you'd like to run the trip. Please have the appropriate number of chaperones according to the age of your students.

The Stations - Intertidal, Bird, and Aquaria

1. Intertidal Stations

Habitat- Identify zones in the intertidal areas, explore zonation and the dominant species in those zones. Take a closer look at zones and the animals within them.

Exploration and Adaptation – Observe various intertidal animals with an emphasis on camouflage, attachment, closing up and hiding, etc. The characteristics of tidepools and the concept of high tide versus low tide will be explored.

2. Bird Station

Species and Habitat- View and identify nesting seabirds and note their associated habitat. Find out what they eat, what eats them, and how they share space on the rock.

3. Aquaria Station

Species Identification and classification - Identify animals in the aquaria, discuss their behavior, how they feed, what they eat, how they survive the low tide, and identify animals that are related and their common features.

Beach Activity 1: Telescope Observations



Tufted Puffins

Where do they nest at Haystack Rock, and what type of nest do they use?

What aspects of the nest location and structure limit predation of eggs and young? Do these birds migrate? If so, where do they go during winter?



Pelagic Cormorants

Where do they nest at Haystack Rock and what type of nest do they use?

Describe how this species forages for prey and what it typically feeds on. How many young does this species typically produce each year?



Western Gulls

Where do they nest at Haystack Rock and what type of nest do they use?

Describe one negative impact and one positive impact Western Gulls have on other nesting seabird species at Haystack Rock. Are these birds predators, scavengers, or both?

Mystery Bird

Name another species of bird you observed at Haystack Rock.

Did it nest at the rock? If so, where did it nest?

Describe one thing you learned about its natural history.

Beach Activity 2: Intertidal Zonation

1. Class teacher or chaperone leans marked rod (flat or pvc pipe), one per student group, gently against vertical wall and returns to rest of group, about 50 feet from wall.
2. Students will be able to see general patterns or “zones” of life on the rock wall (shapes and outlines of large groups of animals) at a distance. Using sketch sheet, students will look at wall and draw a sketch of how it looks (at 50 feet) with reference to the markings on the rod. Sketch need only cover about 6 feet to the right of rod. The resulting sketch will show “life zones” in a general way.
3. Students move closer to wall so that they are 0-3 feet away, close enough to see organisms in the area they sketched.
4. Students now find and identify animals that are present in the “zones” they sketched. On their sketch, they should record the name (or a picture) of each animal they find in the zone where they find it.
5. In the sketch, students should star the most abundant animal found in each zone.
6. Students will look at the intertidal area above the rod and sketch what they see there.
7. Students will look at an area that is lower than the bottom of the rod (may need to turn away to look behind them and move away from the rod). Students will sketch and label animals they see there.

Questions:

1. Which area (that you sketched) seems to have the largest number of animals?
2. Did you find all the same animals and plants in every “zone” that you sketched?
3. In your first sketch, at about what level (on or above you measuring rod) do you think the highest tide reaches?
4. It takes the tide about 6 hours to rise to its highest level and another 6 hours to drop to its lowest level. About how much time do you think animals at the uppermost tide level would be covered with water?
5. At what heights (in your sketch) did you find mussels?
6. At what heights (in your sketch) did you find seastars?



Haystack Rock Species Check List

BIRDS

- Tufted Puffin
- Pigeon Guillemot
- Common Murre
- Western Gull
- Pelagic Cormorant
- Brandt's Cormorant
- Black Oystercatcher
- Harlequin Duck
- Surf Scoter
- Black Turnstone
- Peregrine Falcon
- Bald Eagle
- Other_____

TIDE POOL CREATURES

- Crab
 - Hermit Crab
 - Purple Shore Crab
 - Lined Shore Crab
 - Dungeness Crab
 - Porcelain Crab
 - Red Rock Crab
 - Kelp Crab
 - Mole Crab
 - Other_____
- Barnacle
 - Acorn Barnacle
 - Thatched Barnacle
 - Goose Neck Barnacle
- Nudibranch (sea slug)
 - Sea Lemon
 - Shaggy Mouse
 - Opalescent
 - Other_____
- Sea Star
 - Ochre Sea Star
 - Sunflower Star
 - Other_____
- Sea Anemone
 - Giant Green Sea Anemone
 - Aggregating Sea Anemone
 - Other_____

- Snail
 - Frilled Dogwinkle
 - Striped Dogwinkle
 - Black Turban
- California Mussel
- Limpet
- Chiton
- Sponge

FISH

- Tidepool Sculpin
- Cling fish
- Gunnel
- Other_____

ALGAE

- Green
 - Sea Lettuce
 - Other_____
- Brown
 - Bull Kelp
 - Rockweed
 - Acidic Kelp
 - Winged Kelp
 - Ribbed Kelp
 - Kombu or *Laminaria*
 - Other_____
- Red
 - Coralline
 - Iridescent Seaweed
 - Black Pine
 - Sea Fern
 - Wild Nori or Laver
 - Other_____

VASCULAR PLANTS

- Surf Grass
- Eel Grass

OTHER

Haystack Rock Awareness Program Field Trip Evaluation



School _____ Date of field trip _____
Teacher(s) _____

- 1) What was your favorite part of the beach program and why?

- 2) What was your least favorite part of the beach program and why?

- 3) Did you feel adequately prepared for your visit? If not, what could HRAP have done to better prepare you?

- 4) Were there any topics not covered by the program that you would have liked your students to learn about? Think about this for each of the three stations (intertidal, bird, aquaria).

- 5) In what ways could we improve our program in coming years?

RATING SCALE:

Needs Improvement N	Full Performance		Exceptional Performance: E
	Satisfactory S	Above Average A	

For areas that do not apply, place "N/A" in rating box.

1. Work Product **N S A E**

The Program Coordinator's performance scheduling your trip, finding an appropriate day, time, and tide given schedule availability and weather	
Communication on trip preparation, safety precautions, and tidepool etiquette	
Performance of staff and volunteer interpreters	
Layout of beach program stations	
Amount of time at each station (if N , should it be shorter or longer?)	
Content of intertidal station	
Content of aquaria station (if present)	
Content of bird station	
Content of Mobile Education Unit	
Raters Explanation:	

Please mail, e-mail, or fax form to:

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