BAINBRIDGE PUBLIC LIBRARY SHORELINE GEOCACHE QUEST - ANSWERS

1. Fort Ward State Park

Lat. N47 35 19.65 (N47 35.328) [N47.588792]
Long. W122 31 53.96 (W122 31.899) [W122.531666]

Moderately Difficult. Avoid high tides. Some climbing over or maneuvering around logs may be required. Wear shoes with good traction, and be mindful of slippery rocks.

Latitude: How does a sea anemone catch its food?

19. Sea anemones have tentacles that sting other animals that brush against them. The sting paralyzes the animal, and the sea anemone pulls the stunned animal into its mouth and eats it. If you find an anemone on the beach, you can touch it because the sting won`t hurt you, but it might feel a little sticky. It`s very easy for you to hurt a sea anemone, though, so touch it gently!

Longitude: What can you can do in your home and yard to help prevent toxic stormwater runoff that pollutes Puget Sound?

53. All of the above. Stormwater runoff is unfiltered water that reaches streams, lakes, sounds, and oceans by means of flowing across impervious surfaces. Every time it rains, millions of gallons of toxics run off our streets, driveways, lawns and rooftops into Puget Sound, our lakes, and rivers. The Puget Sound Basin contains thirty percent of Washington roads and streets, or 50,300 miles. This represents thousands of acres of impervious pavement that keeps rain from infiltrating the ground; instead, it all runs off quickly, carrying toxics pollutants adding up to billions of gallons of stormwater runoff from roadways each year.

More tips:
Clean up pet wastes. Runoff can carry wastes into lakes and streams. Dispose of them in your trash or flush them down the toilet (unless you have a septic system).

Drain hot tubs and swimming pools away from waterways and storm sewers. Chlorinated water is deadly to fish and aquatic life, and should be drained onto the ground or into domestic sewers.

If you have an on-site septic system, maintain it properly. Runoff from failing systems can contaminate beaches, making shellfish inedible. It can also cause nearby waters to be unhealthy for wading or swimming.

For even more ideas, go to https://www.epa.gov/nutrientpollution/what-you-can-do-your-yard.

2. Pritchard Park

Lat. N47 36 57.3 (N47 36.955) [N47.615917]
Long. W122 30 33.66. (W122 30.561) [W122.509444]

Easy.

Latitude: The orca whales who live in Puget Sound live in groups called pods. Researchers have discovered that the pods seem to be led by _____?

57. Orca pods are led by the oldest female in the pod. Orcas live in pods made up of family groups that form around the oldest female. Her children and grandchildren spend their whole lives with her. Puget Sound is home to the J, K and L pods of orcas, and each is made up of several smaller family groups.

The whales in a pod each know the unique pod call sound, and they seem to use it to identify each other by family, kind of like our last names!

Longitude: How many pieces of plastic litter enter the world's oceans each day?

33. Eight million. That adds up to 13,000 pieces of plastic for every square kilometer of ocean. Between 90 and 95% of all marine debris is plastic. About 80 percent of marine plastics originate on land, blown or carried to the sea as urban runoff through storm drains and watersheds. Well over half of them are consumer products that haven't been property disposed of.

Marine debris impacts nearly 270 species worldwide. More than a million seabirds and 100,000 marine mammals and sea turtles die each year from ingestion or entanglement.

3. Ferry Dell Park

Lat. N47 40 16.1 (N47 40.268) [N47.671139]
Long. W122 34 40.8 (W122 34.680) [W122.578055]

Moderate. This requires a walk of about 1/4 mile down and back up a fairly steep trail that can get muddy in places after a rainfall. Wear good walking shoes.

Latitude: What should do if you find a baby seal alone on a beach?

16. You should leave it alone. Mother seals often leave their babies alone on the beach while they fish. Sometimes people find them and think they`ve been abandoned, but really they`re OK. If you find a baby seal that`s alone and you REALLY think it needs help, call an aquarium, zoo, or wildlife rehabilitation center and tell them about it. They`ll help you figure out if the seal really needs help.

For more information, go to **www.westsoundwildlife.org**.

Longitude: Plastic litter typically bio-degrades in about

40. Plastic is forever – it does not bio-degrade. Every piece of plastic that has ever been made in still with us today. Plastic does, however, photo-degrade, which means it slowly breaks apart into smaller and smaller pieces, called "micro-plastics." These micro-plastics mimic natural micro-organisms, like plankton, that play a critical role in the aquatic food chains. They now outnumber zooplankton in the marine environment by 6 to 1.

The toxins from plastic debris are showing up in shellfish, harbor seals, orca whales, seabirds, and fish and working their way up the food chain to the seafood that we eat.

4. Schel-Chelb Estuary

Lat. N47 36 15.3 (N47 36.255) [N47.60424]
Long. W122 33 4.6 (W122 33.217) [W122.55127]

Easy.

Latitude: Why is it important to protect the eelgrass found growing in tideflats?

15. All of the above. Each blade of eelgrass is a small food factory. Diatoms, bacteria, and detritus (decaying plant and animal matter) gathers on eelgrass leaves. This detritus provides food for many invertebrates; isopods, amphipods, polychaete worms, brittle stars, and some clams. The large number of invertebrates present make eelgrass beds rich feeding areas for fish and marine birds. As eelgrass

dies, bacteria and fungi feed on the dead leaves, breaking them down into tiny bits. These particles of plant material provide vital nutrients for the nearshore food web.

Many animals use eelgrass beds for nursery areas, others swim or walk among the leaves, or burrow in the sediments. Within eelgrass meadows, there is food and shelter for a wide variety of sea anemones, marine worms, snails, limpets, crabs, birds, and fish.

Eelgrass meadows cushion the impact of waves and currents, preventing erosion. Eelgrass roots weave sediments in place. This protection helps preserve the highly productive bacteria in the sediments which nourish large amounts of invertebrates.

Dredging destroys eelgrass and eliminates food and shelter for an entire ecosystem, while structures such as docks can prevent eelgrass from getting enough light to grow.

Latitude: The major source of pollution in Puget Sound is from:

5. Stormwater runoff is unfiltered water that reaches streams, lakes, sounds, and oceans by means of flowing across impervious surfaces. These surfaces include roads, parking lots, driveways, and roofs. Polluted runoff is one of the major pathways for toxic pollution to enter the Puget Sound Basin.

Every time it rains, millions of gallons of toxics run off our streets, driveways, lawns and rooftops into Puget Sound, our lakes and rivers.

The Puget Sound Basin contains thirty percent of Washington roads and streets, or 50,300 miles. This represents thousands of acres of impervious pavement that keeps rain from infiltrating the ground and instead it all runs off quickly carrying toxics pollutants adding up to billions of gallons of stormwater runoff from roadways each year!

For more information, go to https://www.epa.gov/nutrientpollution/what-you-can-do-your-yard.

5. Blakely Harbor Park

Lat. N47 35 50 (N47 35.8333) [N47.59727]
Long. W122 30 56 (W122 30.9333) [W122.51583]

Easy.

Latitude: How do mussels protect themselves from predators?

50. Mussel shells manufacture strong, elastic threads to attach themselves to a rock or piling so firmly that they can't be pulled off until they die. When a predator like a sea star approaches, they spin out extra threads, tethering the would-be attacker to a nearby rock or piling until it starves to death.

Longitude: What can you do to protect Puget Sound salmon habitat?

56. All of the above. Although salmon spend only a part of their life cycle in nearshore areas, these habitats are critical to the survival of salmon populations. Shoreline habitats of Puget Sound have suffered significant losses over the last 125 years.

Loss of Marshes
When marshes are lost, young salmon lose food and shelter. Studies show a 73 percent decline in salt marsh habitats bordering Puget Sound. Nearly all salt marsh habitats within major urban areas along Puget Sound have been destroyed. The Puyallup River Delta, for example, lost 100 percent of its nearshore habitat.

Pollutants
Recent studies show that juvenile salmon may suffer adverse effects from passing through polluted estuaries and nearshore areas. Human-caused stresses (toxic chemicals, pathogens and parasites) can cause immune dysfunction, increased susceptibility to disease, and impaired growth.

Bulkheads
Bulkheads, seawalls, and other hard shoreline armoring structures can disrupt shore drift, starving beaches of sediments, and juvenile salmon of food and shelter. Bulkhead construction can also destroy shoreline vegetation, eliminating cover and food sources for young salmon.

Loss of Shoreline Vegetation
Loss of vegetation along the shore is of particular importance to juvenile salmon. Shoreline vegetation stabilizes the shoreline, provides shade, protective cover, organic input, and food (insects) to young salmon moving in close to shore.

Docks & Piers
Docks can block light to underwater habitats such as eelgrass meadows, a source of food and shelter for juvenile salmon and other marine life.