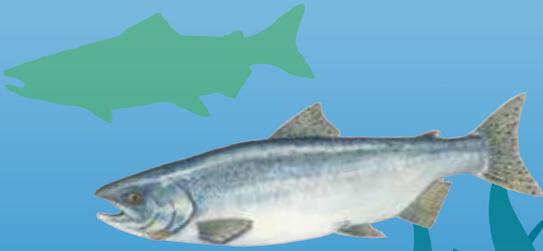


Port Susan Owner's Manual



Port Susan.
It's Great Here.
Let's Keep it
That Way!



Welcome to Port Susan: An Owner's Manual

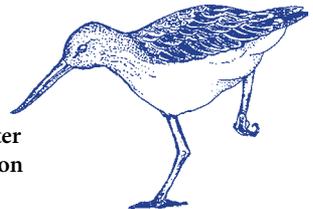
Port Susan is a uniquely beautiful and biologically rich body of water nestled between Camano Island and northwest Snohomish County. It is famous for salmon, gray whales, crabs, shellfish and birds. Port Susan is intricately tied to the surrounding land - receiving rain and snow melt from over 680 square miles. Port Susan, truly a special place, has been designated a Marine Stewardship Area.

Port Susan also offers abundant recreation opportunities, locally grown food and a quality of life that continues to attract people. It has sustained countless generations before us and it is up to us to keep it healthy for generations after us. Just like any investment, Port Susan requires attention to continue offering the same quality of life that today's residents enjoy for generations to come.

This Owner's Manual introduces you to Port Susan's natural areas and wildlife (**Features at a Glance**, pages 3 – 12), some steps for its care (**Operating Instructions**, pages 15 -17), references for more information (**Customer Support**, page 17) and a **Description of Marine Stewardship Area status** (page 18). Enjoy learning about this amazing place that so many of us call home.

Cover Photo Credits:

Historical photos of salmon catch, Kathleen Herrman
Dunlin flock in flight and dunlin on the beach, Gary Slater
Man fishing on dock and family on dock, Trevor Anderson



Features at a Glance

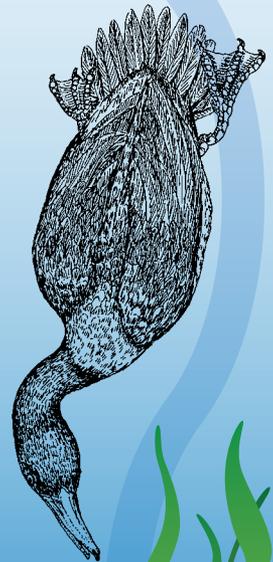
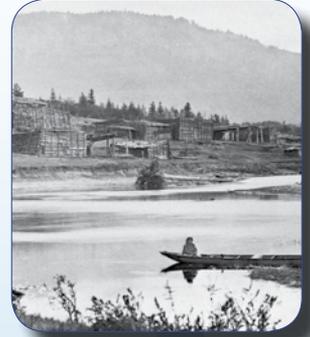


Camano Island has had many names: Kol-lut-chen (Native American meaning Land Jutting Into the Bay), MacDonaugh Island in 1838 for a captain in the War of 1812, Perry Island during the 1855 treaty signing, Crow Island by loggers in the 1900s and finally, Camano - for a 1700 Spanish Navy Explorer, Jacinto Camaano.

Port Susan People

The Port Susan area has been home to people and wildlife for many generations. The Stillaguamish Tribe (originally known as Stoluck-wa-mish) lived along the Stillaguamish River and its tributaries. They were here when Captain Vancouver explored the waters of Port Susan in 1792 and when he named the area after Lady Susan, the wife of Sir Alan Gardner.

Today, Port Susan is shared by both Island and Snohomish Counties and is inhabited by a diversity of people including, fishermen, farmers, hunters, bird watchers, kayakers, tribal members, residential land owners and large and small business owners and employees, new residents and those who can date their families' arrival back to the settlers. All call Port Susan home. All would agree that Port Susan is a unique place.



Coast Salish tribe village from 1861, Image PN01459
Photo courtesy of Royal BC museum, BC archives



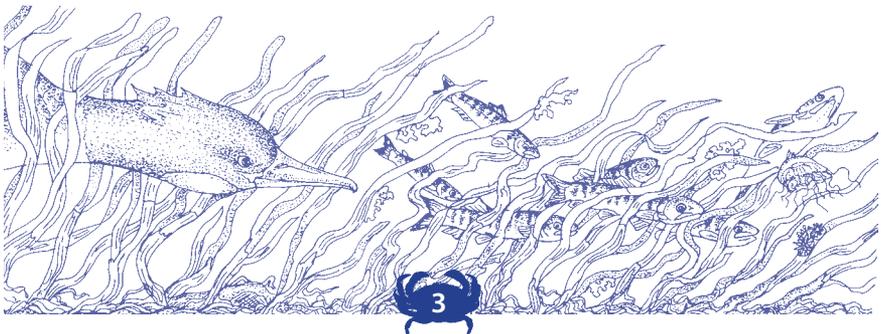
Features at a Glance

The Estuary

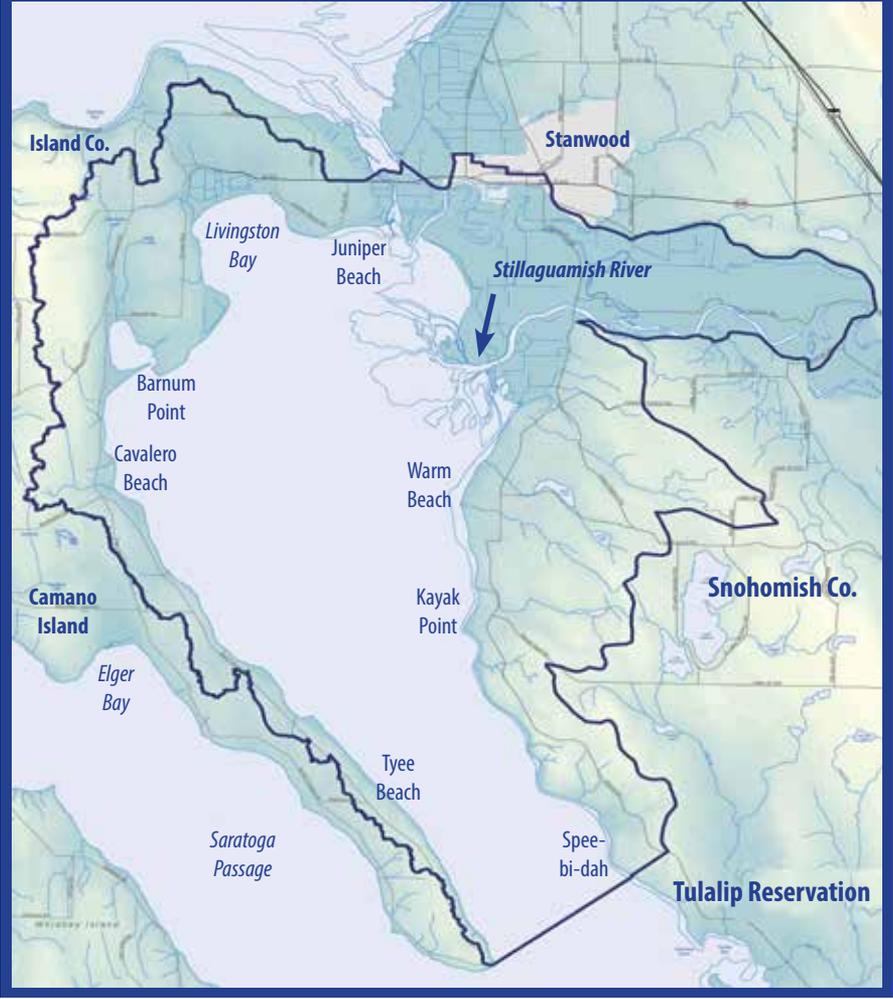
Port Susan is a shallow, sheltered estuary where salt and fresh water mix. A large amount of the freshwater is carried in by the Stillaguamish River, as well as many small streams on East Camano Island and northwestern Snohomish County. Salt water enters Port Susan from the south, through Puget Sound. Given all the freshwater sources, the salinity of Port Susan is quite low, supporting a wide diversity of plant and animal life.

The Port Susan landscape was shaped when glaciers last covered this land about 12,000 years ago. As the glaciers grew, they gouged out the deepest portions of Puget Sound. When they melted, they deposited large quantities of gravel, sand and cobble, transported from the north. These mounds created the bluffs and hillsides that surround much of Port Susan today.

Port Susan is like a mosaic with distinct patches of plants, animals and sediment types. The large fan-shaped delta to the north, composed mostly of sand and mud, forms as fine sediments fall out of the Stillaguamish River entering Port Susan. Coarse, mixed sand and gravel beaches line the western and south eastern shorelines, feed by frequent erosion of sand and gravel from the nearby bluffs. Man made structures, like bulkheads, can interrupt the flow of sediment, increase erosion and change the beach over time.



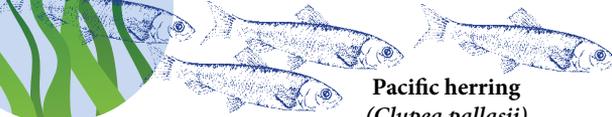
Map of the Port Susan Marine Stewardship Area



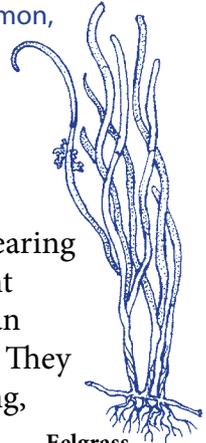
 Port Susan Marine Stewardship Area



Pacific herring lay their eggs in eelgrass.
Herring are a major food source for salmon, seabirds and marine mammals.



Pacific herring
(*Clupea pallasii*)



Eelgrass
(*Zostera marina L.*)

Eelgrass is a our only true sea grass in Port Susan, bearing flowers and roots. Eelgrass meadows require sunlight to grow so are only found underwater where light can penetrate to Port Susan’s soft bottom – up to 22 feet. They provide habitat (food, rearing and shelter) for herring, juvenile crabs, salmon and many more creatures.

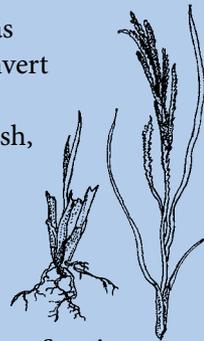
Tides are a part of Port Susan life. The greatest reason for tides is the gravitational pull from both the moon and sun against the earth. That tug causes the oceans to move towards the moon and sun, creating a bulge of water on the surface of the earth. The bulge is biggest when the sun and moon are aligned, and smallest when they are perpendicular to one another.

Port Susan’s mudflats contain more life in weight than local forests. The mudflats are seething with diatoms, a type of algae which converts sunlight into energy. Diatoms act as the base of the food web for all of the animals we see in Port Susan.

Spartina is a non-native plant from Europe that was introduced to Port Susan by farmers hoping to convert tidelands into productive grazing areas. It changes mudflats into grassy meadows crowding out shellfish, shorebirds, crabs and other wildlife.

Neighbors, government and community groups have worked to eradicate this weed so it remains only in the north end of Port Susan.

Contact Invasivespecies@rco.wa.gov to report a sighting and prevent spreading.



Spartina
(*Spartina alterniflora*)

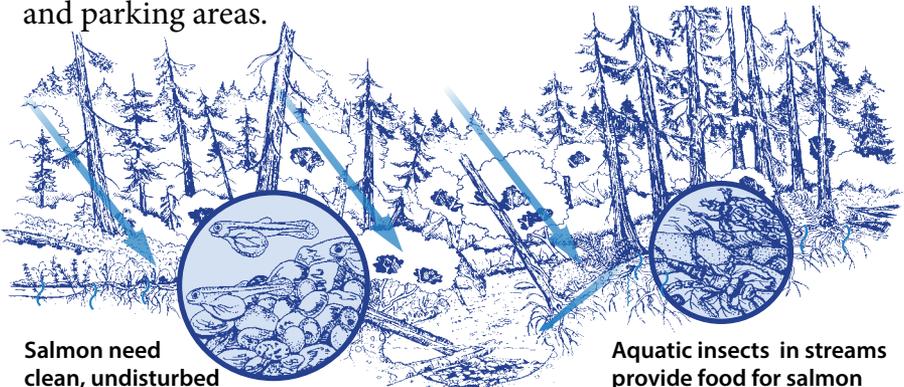
Features at a Glance

Water, Water Everywhere!

Our region is blessed with a mild climate due to the proximity to Puget Sound marine waters and Pacific Ocean currents that bring in warm moist sea air. On average there is 21” of rainfall in Stanwood each year. Despite periods of intense wetness, water is still a limited resource with dry conditions from June through September.

Over time, humans have changed the Port Susan landscape from a patchwork of forests, streams, lakes and wetlands into farms, cities, and suburban communities. We have cleared the trees and replaced natural, absorbent soils with pavement, roofs and roads that are impervious to water, reducing the amount of water that can soak into the ground. One result of increased hard surfaces is increased and faster water runoff into local streams and eventually Port Susan. This increases the scouring and erosion of stream channels that increase flooding, damage fish spawning areas and flushes away aquatic insects important to a healthy stream.

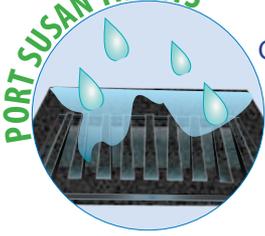
Healthy streams and nearshore habitats have areas of vegetation (riparian zones) which can slow and soak up stormwater and filter pollutants entering the waterways from our roads, roofs and parking areas.



Salmon need clean, undisturbed gravel in streams to survive.

Aquatic insects in streams provide food for salmon and other fish.

PORT SUSAN TIDBITS



One acre of parking lot can create 16 times more storm water runoff each year than a meadow.

Fallen rain and snow melt pick up soil, oil and grease from vehicles, nutrients from fertilizers, chemicals from homes and businesses and pet, livestock and wild animal feces. This brew of rainfall and pollutants is often referred to as stormwater.

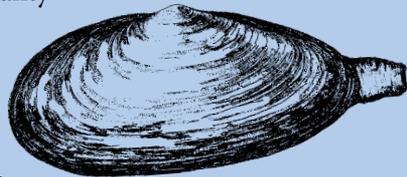
Pollution from stormwater makes up the majority of all toxic contamination entering Puget Sound today. Pollution comes from all of us. Our collective actions to reduce pollution at home, work and on impervious surfaces will help keep Port Susan's landscape healthy for future generations.

Fecal coliform bacteria live in the digestive tracks of warm-blooded animals, including humans, and are excreted in feces, with some bacteria being harmful to humans. Shellfish absorb bacteria as they feed, creating health threats for people who eat them.

Elevated fecal coliform levels in Port Susan in the late 1980's led to the closure of all commercial shellfish beds. From 1978 - 1982, over 1 million pounds of hard and softshell clams were harvested each year. It is estimated there are 33 million pounds of eastern softshell clams in Port Susan, unable to be commercially harvested, since closure occurred. Water quality improvements led to 1800 acres of commercial shellfish beds reopening in April 2010.

We're seeing improvements, and there is still more work to do.

Large industries are no longer the leading cause of pollution today. It is us.



Eastern softshell clam
(*Mya arenaria*)

Features at a Glance

Wildlife

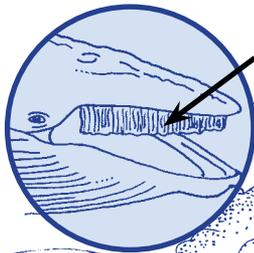
There are over 200 types of animals that live or visit the Port Susan area. It is the permanent or temporary home to thousands of migratory shorebirds, waterfowl, raptors, salmon and sturgeon. The extensive eelgrass beds, salt marshes and mudflats of Port Susan support a large array of wildlife.

Walking or Crawling:

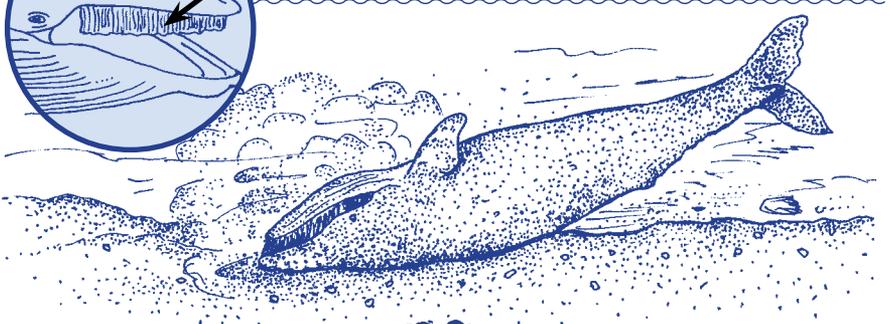
Animals that can be found on the land around Port Susan range from river otters to bobcats to rough skinned newts. Beavers create ponds with their dam building practices, creating many different niches for wildlife and places for water to flow into the ground. Western thatch ants live in large mounds of plant matter, feed flickers and are used as mite and microbial control.

Swimming:

Grey whales spend several months in spring and summer feeding in the waters of Port Susan and surrounding areas. They come to feed on creatures that live in the mud, taking big bites out of beaches and filtering the water from their mouthful of food.



Baleen acts as a sieve filtering food from sea water for some species of whales.



PORT SUSAN TIDBITS



A salmon can smell just as well as a dog. Copper, found in pesticides, moss treatment products and some brake pads, wipes out a coho salmon's sense of smell so they don't detect when a predator is around.

There are 42 species of fish in Port Susan, from steelhead to sculpin. The white sturgeon lives up to 100 years and does not begin breeding until 15 or 20 years old. They feed without teeth by sucking up their prey.



White sturgeon
(*Acipenser transmontanus*)

White sturgeon were trapped in Port Susan hunting for food. Most made it out alive with the returning tide.
Photo courtesy of Stef Frenzl

The Stillaguamish River is home to five species of salmon as well as steelhead populations, one winter and three summer that stay in freshwater for one to three years before heading to Port Susan and Puget Sound. In 1999, Chinook salmon and bull trout became “Threatened” under the U. S. Endangered Species Act followed by steelhead in 2007. Local hatcheries release 100,000 –130,000 winter and 80,000 summer young trout each year. Tribes, government agencies and community groups all began working together to make sure salmon are in Port Susan 100 years from now. You can help too.

Floaters:

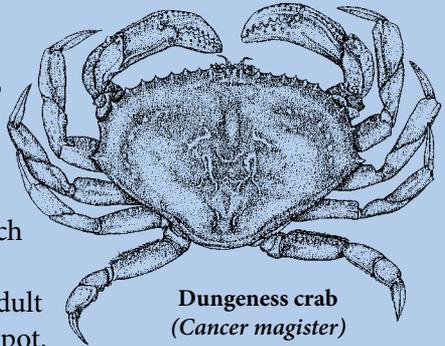
Plankton blooms are what make Port Susan's waters so cloudy in the spring. Plankton can be seen with the naked eye, although they are very small. Plankton include the young larval stage of many of the creatures we see on the beach, like barnacles and crabs, as well as plants. They don't swim – they simply float wherever the water takes them. The plant plankton (phytoplankton) convert sunlight into energy and become food for many other animals in Port Susan.

On the Beaches:

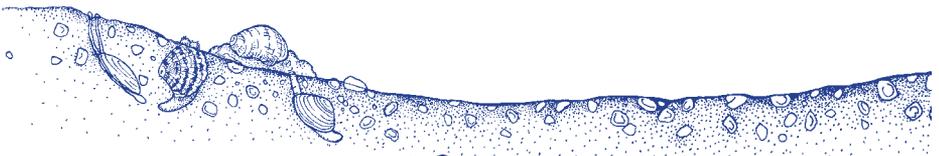
Shellfish are filter feeders. Using a neck that extends to the beach surface, they suck in water that contains their food – plankton. The varnish clam is purple on the inside with a flaky peel on the outside. A new arrival to this region, it has spread rapidly, especially in areas with fresh water seeps. The jury is still out on whether or not varnish clams are invaders or friends although many residents harvest them.

In 2012, over 550,000 pounds of dungeness crabs were harvested in and around Port Susan, by commercial, recreational and tribal fishers – a 500% increase from the 1970s. To provide crabs for the future, it is important to keep only male crabs over 6.25" since it is the smaller, male crabs that create the most offspring.

Over 12,000 crab pots are lost each year, so it is important to use a biodegradable escape cord so adult crabs can escape if you lose your pot.



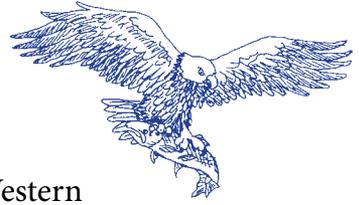
Dungeness crab
(*Cancer magister*)



PORT SUSAN TIDBITS



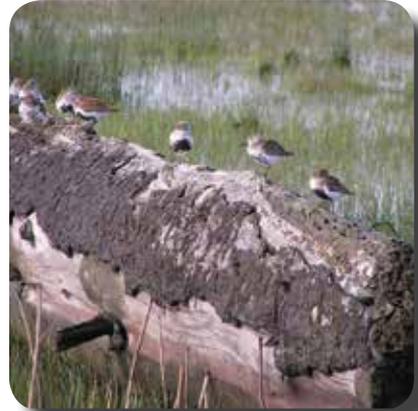
If you swapped your eye for a Bald eagle's, you could see an ant crawling from the roof of a ten story building.



Flying:

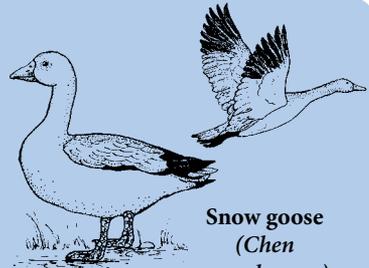
In winter, seabirds and ducks such as the Western and red-necked grebes, buffleheads and scoters visit Port Susan. There are also loons, scaups, common murres and long-tailed ducks. Trumpeter and tundra swans make a majestic appearance in the winter as well.

Over 50,000 birds visit Port Susan each year including 165 types of shorebirds that visit or live in Port Susan. The most common, dunlin, travel here to feed on clams, worms, insect larvae and amphipods. They breed further north, in wet coastal tundra areas. Avian predators, like peregrine falcons, take their toll on dunlin populations each winter.



Dunlin roosting on beach log.
Photograph courtesy of Gary Slater

Up to 55,000 snow geese winter in the Skagit Bay / Port Susan area. They feed on native bulrush from the marsh and winter grain from agricultural fields. Snow geese are a success story: In 1990, there were only 2000 – 3000. Today there are 6-7 million.



Snow goose
(*Chen caerulescens*)

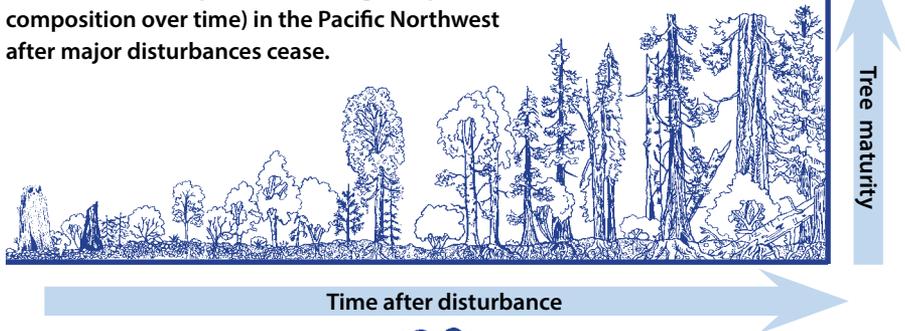
Features at a Glance

Trees in Port Susan

Trees are important features for Port Susan's health. Shade from trees helps keep water temperatures and beach sediments cool, making them more hospitable for shellfish, beach insects and young fish. Tree leaves, branches, trunks and dead parts provide critical nesting, roosting and feeding opportunities for many kinds of birds. Fallen wood creates nooks and crannies on beaches and in rivers that slow water down and provide havens for fish and insects throughout the year. Eventually, these fallen trees may wind up in Port Susan offering roosting places for shorebirds and shady areas under the logs for insects to burrow. Tree and shrub roots also slow erosion and filter pollutants from stormwater before it gets to Port Susan.

The forests surrounding Port Susan were historically composed of western redcedar, Douglas-fir, western hemlock and Sitka spruce trees. In a forest, when mature trees die and create gaps in the canopy, shade loving species such as grand fir, become established. Unless there is another disturbance, whether natural or manmade, these shade loving trees will take over. The variety of available tree types creates homes and resources for many types of wildlife.

Forest succession (process of change in species composition over time) in the Pacific Northwest after major disturbances cease.



Recreational Opportunities

There are many places to enjoy Port Susan's natural beauty. Using the chart below, you will be able to find places to hike, boat, camp, kayak, jog, watch wildlife, fish, ride horses, swim, kite and so much more! Check them out!

Park	Walter G. Hutchinson	Tillicum Bay	Cavalero Beach	Barnum Point (open in 2015)	Iverson Spit	Livingston Bay
Location	SE Camano	SE Camano	East Camano	Mid-east Camano	NE Camano	NE Camano
Park Activities						
Beach Access 		X	X	X	X	X
Boat Access 			X			
Clamming 						
Swimming 						
Camping 						
Hiking 	X			X	X	
Bird Watching 					X	
Picnicking 	X	X			X	
Fishing 				X	X	



The number of people in Snohomish and Island Counties who have purchased saltwater fishing licenses from 2001 to 2009 has jumped between 30 – 50%.

Park	Kayak Point County Park	Wenbug State Park	Twin Rivers	River Meadows	Centennial Trail
Location	Stanwood	Stanwood	Arlington	Arlington	Arlington
Park Activities					
Beach Access 	X	X	X	X	X
Boat Access 	X	X			X
Clamming 					
Swimming 	X	X	X	X	X
Camping 	X	X	X	X	X
Hiking 	X	X		X	X
Bird Watching 	X	X		X	
Picnicking 	X	X	X	X	X
Fishing 	X	X		X	X

Operating Instructions

Stormwater pollution is our number one water pollution source into Port Susan and we can each do our part to keep it healthy.

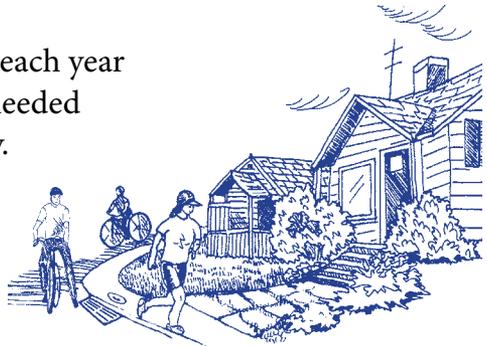
Encourage Natural Soil Filtration on Your Property:

- Look for ways to keep runoff out of the stormwater system and allow it to soak into the ground (as long as you are not on a steep bluff or slope).
- Consider planting rain gardens, using rain barrels, installing green roofs or creating bio-swales.
- Reduce the amount of paved or hard surface areas. Consider permeable paving for that new patio or driveway.



Clean Up Stormwater:

- Reduce fertilizers, turf builders and pesticides on your lawn and garden. Use small amounts of the least possible toxic products and consider hand pulling weeds, sweeping moss off of roofs and learning to love a little imperfection.
- Fix vehicle leaks promptly. Consider alternatives to driving solo.
- Inspect your septic system each year and pump the tank when needed to keep it working properly.
- Pick up your pets' waste and put it into the trash to keep bacteria pollution out of Port Susan.
- Collect and cover animal manure on small farms.



PORT SUSAN TIDBITS



Each year, vehicles release 7 million quarts of motor oil and other petroleum-related products into the Puget Sound watershed.

Plant or Retain Trees for Shade and Filtration:



Know your site and choose trees that will be suited to it when they are mature. Consider sunlight, soil type, moisture needs and proximity to structures and drain fields, maintenance and pruning needs.



Prune trees for views rather than cutting them down. Never top a tree as it could lead to disease and encourage new growth exactly where you don't want it.

Do it Together:



Get involved in neighborhood projects like storm drain stenciling or tree planting.



Talk with your neighbors about Port Susan and encourage them to help keep it healthy too.



Customer Support

Port Susan Marine Stewardship Area

www.snocomrc.org

Keeping Port Susan Healthy

www.BetterGround.Org

www.PugetSoundStartsHere.Org

Getting Involved

www.beachwatchers.wsu.edu

www.soundsalmonsolutions.org

www.nature.org (search Port Susan)



Photo courtesy of Trevor Anderson

Getting Outside

Washington State Parks: <http://www.parks.wa.gov/>

Island County Parks: www.islandcounty.net/publicworks/parks/Camano_Island_Parks.html

Snohomish County Parks:

<http://snohomishcountywa.gov/200/Parks-Recreation>

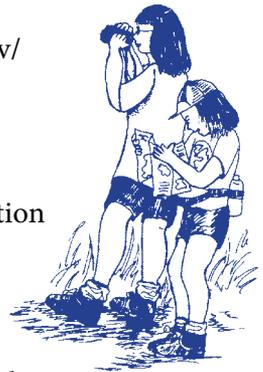
Know Before You Harvest

Harvesting Rules:

wdfw.wa.gov/fishing/shellfish/statewide_rules.html.

Shellfish Closures:

hwww.doh.wa.gov/CommunityandEnvironment/Shellfish/BeachClosures.aspx



Booklet design & illustration:
Sandra Noel/Noel Design, LLC
www.noeldesigninterp.com

What is the Port Susan Marine Stewardship Area?

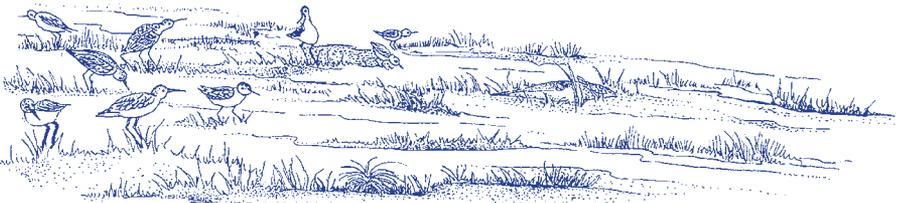
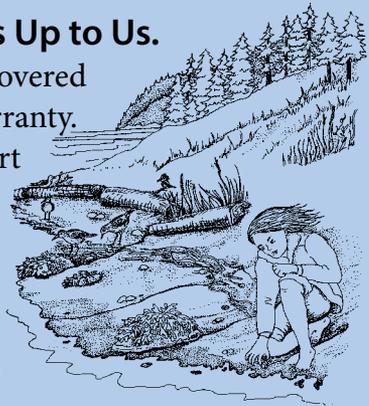
Port Susan was designated a marine stewardship area (MSA) by Island and Snohomish County elected officials. This status encourages conservation of the natural, cultural, and scenic value of Port Susan by users and government agencies alike. It encourages citizen participation and a common community vision, without creating new regulatory authority.

This designation will lead to a greater understanding of the marine environment and help ensure Port Susan continues to provide diverse benefits for all people. This designation will encourage protection of marine resources through education, citizen involvement, partnerships and collaboration, strong leadership and coordinated enforcement of existing regulation.

Keep Port Susan Healthy. It's Up to Us.

Unfortunately, Port Susan is not covered with a lifetime, unconditional warranty.

Port Susan will continue to support a robust wildlife population and a thriving human community if those of us who live, work and play here act to protect it now, and for future generations.





Why an Owner's Manual?

We keep owner's manuals for investments we've made in our homes and cars.

This booklet is designed to be kept handy because Port Susan requires understanding of its parts and our own careful actions.

This information will be useful as long as you live, work or play in this amazing place.

