Sharing Our Shorelines

DISTRICT OF METCHOSIN
INCORPORATED 1984

We play an important role in the protection and preservation of our local environment, a place we share with countless land and marine species.

Metchosin's 45 km shoreline is a vital link between our terrestrial world and the marine ecosystems of the Strait of Juan de Fuca, providing essential food and habitat for many forms of land-dwelling and sea life.

Our choices and stewardship actions can ensure the survival of the species with which we share our community, while enriching our outdoor experiences. From hiking the coastline or spending a day on the beach, to fishing for salmon or watching our endangered resident orca whales, our shoreline is a resource we treasure.

Values and Views
District of Metchosin

Marine By Nature

Ancient glaciers and modern oceanic forces have shaped Metchosin's geography. There are many values attributed to the coastal areas of Metchosin that have been recognized in the Official Community Plan.

Above: Hooded female merganser;
Below: Metchosin pocket beach

This brochure has been developed by the Metchosin Environmental Advisory Select Committee to introduce you to some simple steps you might take to ensure our local waters continue to support vibrant and abundant marine ecosystems.

Ice Age Legacy

What are coastal bluffs and shoreline beaches?

Coastal bluffs and beaches are dynamic habitats where erosion is the rule. Bluffs are the product of ice-age sediment movement, entrapment, and recent exposure and erosion. Glacial sediment from feeder bluffs, streams and creeks form pebble/sand beaches.

Erosion of coastal lands and watersheds provide the very sediments that create the beaches we treasure for our coastal access and enjoyment.

Above: Naturally eroding bluff

Below: Pacific sand lance on Witty's Beach

Bottom: Witty's Lagoon

Where are feeder bluffs and beaches located?

Feeder bluffs are found on Parry Bay on the north end of Taylor Beach, and north of Albert Head. Sand and gravel beaches include Albert Head, Witty's and Weir's Beaches, and pocket beaches along Parry Bay.

Why are bluffs and beaches important?

Important to the marine food web, they provide habitat for burrowing worms and clams, the early life stages of some marine invertebrates and migratory bird feeding areas.

At the high tide line, these pebble/sand nurseries are also spawning habitats for some forage fish. These small feeder fish are critical to the survival of fisheries and thousands of fish, bird, and marine mammal predators.

Protecting Bluffs and Shoreline Beaches

In addition to the activity of the oceans, bluffs erode and slump because of build-up of water in the soil, which is sometimes due to development at the top of the bluff. Hard armouring at the base can actually increase erosion of these landforms, while trapping sediment behind seawalls and piers can cause beaches to degrade over time.

- Keep buildings back from the bluff or shoreline edge
- Maintain vegetation and manage drainage of waste/storm water
- Use gravel for driveways
- Use soft-shore erosion protection methods (not hard seawalls) to protect your waterfront

Coastal Lagoons, Estuaries and Salt Marshes

Metchosin's Coastal Lagoons

Below: Salt tolerant plants in Witty's Lagoon

Coastal lagoons and estuaries are nourished with sediment from freshwater rivers and streams but retain, at least occasionally, an open connection to the marine waters. A coastal lagoon may contain a salt marsh with terrestrial plant species that have evolved to tolerate the high salinity of the brackish water.

Q Where are coastal lagoons and salt marshes located?

Metchosin has two coastal lagoons: Witty's Lagoon and Albert Head Lagoon. Bilston Creek empties its fresh water into Witty's Lagoon, and North Latoria Creek seasonally flows into Albert Head Lagoon. A tidal-zone salt marsh bordering Witty's Lagoon adds even more diversity to the rich ecology.

Along Taylor Beach, Gooch and Sherwood Creeks form marshes that remain trapped behind sand and gravel barrier berms for much of the year. Winter rainfall fills the ponds behind the berms and eventually openings are forced to the Strait of Juan de Fuca, allowing blue-listed species of sea-run cutthroat trout to access the creeks where they spawn.

Below: Albert Head Lagoon

Bottom: Witty's Lagoon

Q Why are coastal lagoons, estuaries and marshes important?

The calm, warm and shallow, nutrient-rich waters and sediments of lagoons and marshes supply critically important feeding, nursery and rearing areas for many fish, invertebrate and bird species, both resident and migrating.

Did you know?

...that coastal lagoons and marshes rank among the most productive ecosystems in the world?.....And lucky Metchosin has both!

Marine Riparian Vegetation

What is marine riparian vegetation?

The term marine riparian vegetation refers to grasses, shrubs, trees and logs lining marine shorelines. Marine riparian zones link the land and the sea through the exchange of water, sediments and nutrients.

Above: Camas at Tower Point

Below: Roots stabilize slopes

Bottom: Natural vegetation protecting cliffs at Albert Head Beach

Where is marine riparian vegetation located?

Vegetation above the high water mark, within backshore areas, and on bluff tops and slopes, form the marine riparian zone.

Why is marine riparian vegetation important?

Maintaining shoreline vegetation is a net benefit to property owners as a free ecosystem service, limiting erosion and stabilizing slope soils. Trees and shrubs absorb large volumes of rainwater, and filter pollutants. Vegetation removal may cause large sediment loads to enter the ocean, limiting light for eelgrass growth and clogging fish gills.

Insects that fall from shoreline vegetation are critical for young salmon growth. Removing overhanging shoreline vegetation from summer surf smelt spawning beaches causes embryos to die. Fish losses affect the entire food web. Vegetated buffer zones are a wildlife migratory corridor and leaf litter provides nutrients to stimulate marine plankton growth.

Protecting Marine Riparian Vegetation Functions

- Provide for marine riparian buffer zones (setbacks) from the high water mark
- Leave trees and native vegetation to stabilize bank and slope soils
- In order to improve your view, only trim or limb trees
- Maintain native plant species and minimize lawns

Land and Sea Connections

Intertidal Habitats

What are intertidal habitats?

Marine shoreline areas exposed by the tides create the dynamic intertidal environment. Rocky shores, sand/pebble beaches, estuaries, and mud and sand flats are constantly molded by ocean waves and currents.

Why are intertidal habitats important?

Home to hundreds of marine species, intertidal habitats connect foodwebs from the land to the ocean abyss. Year-round residents include your favourite tide pool anemones and hermit crabs. Black oystercatchers feed and nest along rocky shorelines. Great blue herons and bald eagles stalk their prey along the water's edge. Sand/pebble beaches provide spawning areas for forage fish. Burrowed within the sand grains, Pacific sand lance, clams, worms, and amphipods attract many predators. Salt-tolerant grasses line vibrant estuary shores, essential nurseries for countless bird and fish species.

Following ancient flyways, shorebirds gorge on prey hiding beneath the sandy surface before beginning their marathon migrations to nesting grounds. Juvenile salmon feed along these shores before undertaking their oceanic journey. The intertidal zone supports wildlife and our wild fisheries.

Above:
Black oystercatcher

Below:
Intertidal invertebrates and sea snail eggs

Below Left:
Sea anemone

Fragile by nature: Protecting Intertidal Habitats

- Tread lightly, and carefully explore tidepools and under rocks
- Replace rocks in the same position you found them
- Be aware of bird nesting times and locations
- Participate in local shoreline cleanups
- Consider a conservation covenant for your property
- Follow shoreline stewardship best practices
- Follow a soft-shore approach to protect property
- Take only pictures, leave only footprints

Marine Shorelines are Critical Fish Habitats

Beach Spawning Forage Fish

When we think of spawning habitat for fish, we generally think of salmon spawning on gravel beds in rivers. But have you ever seen surf smelt leaping at high tide?

Above: Surf smelt and Pacific sand lance

On the very pebble/sand shorelines on which we like to walk, surf smelt and Pacific sand lance deposit spawn near the log line. Herring eggs can also be found from mid-intertidal to deeper waters. For two years, Metchosin citizens trained by the BC Shore Spawners Alliance, worked to determine that Laird Beach and Taylor Beach are active surf smelt spawning beaches.

Forage fish species like surf smelt, Pacific sand lance (needlefish) and herring form the cornerstone of marine food webs. These small feeder fish are critical to the survival of fisheries and thousands of predators from fish and birds to marine mammals.

From sand grains to salmon, it's all connected!

A healthy spawning beach has an intact marine riparian buffer zone, overhanging vegetation that offers shade, and a supply of pebble, sand and clean water. These spawning areas are in a zone highly vulnerable to human activities.

Below: Forage fish monitoring leader, Ramona de Graaf

Shade from overhanging marine riparian vegetation keeps summer surf smelt eggs moist. Removing shoreline vegetation increases temperatures within the spawning gravel. On hot summer days, these eggs can't survive.

Hardening and altering shorelines degrades and destroys spawning habitat. Seawalls block sediments from reaching the beach and wave scouring removes pebbles and sand. Boat ramps and breakwaters interrupt sediment flow along beaches until these areas become starved of fine sediments.

Bottom: Spawning surf smelt

Did you know?

The diets of salmon and rockfish are comprised mainly of these feeder fish, with sand lance making up at least 50% of the diet of adult Chinook salmon. Chinook are a critical food source for resident orca whales. From little fish, big fish grow!

Protecting Critical Fish Habitats

- Maintain shoreline vegetation
- Use soft-shore alternatives to protect waterfronts
- Set erosion protection back from the high water mark
- Manage storm-water runoff
- Take action on climate change issues

Vital Marine Nurseries

Eelgrass Habitats

What is eelgrass?

Eelgrass, *Zostera marina*, is a true flowering plant, not a seaweed, and needs clean water and ample light. Eelgrass meadows generate food and provide habitat for an astonishing diversity of marine life.

Where is eelgrass located?

Eelgrass grows along protected shorelines of bays, inlets and estuaries. In Metchosin it is found in Parry Bay and Eemdyck Channel. Eelgrass grows near the low tide line to depths of 15-20 meters and blades can be up to 2 meters in length. Look for the long emerald green blades draping the ocean surface at lower tides.

Above:
Eelgrass bed

Bottom Left:
Juvenile copper rockfish

Bottom:
Eelgrass bed

Why are eelgrass habitats important?

Eelgrass beds support hundreds of marine species that use this habitat as nurseries and rearing grounds, such as crabs, salmon and rockfish. In spring, eelgrass blades are heavy with herring eggs. Other marine animals common in eelgrass beds are the bay pipefish and the eelgrass nudibranch. The great blue heron stalks prey hiding within the meadow, and eelgrass habitat supports numerous BC fisheries.

Decomposing eelgrass and seaweeds are an ocean fertilizer, recycling nutrients to refuel marine food webs from the intertidal to the deep sea. Eelgrass protects shorelines by buffering waves and stabilizing sea floor sediments. Marine vegetation, such as eelgrass, is an efficient carbon sink, protecting our entire planet.

Protecting Eelgrass Habitats

Shading and physical disturbance damage eelgrass. Excessive nutrients, polluted water and rising ocean temperatures are detrimental to eelgrass health.

- Anchor outside eelgrass beds and use mooring cans and public docks
- Use oil-absorbing bilge pads and pump-out stations for vessel sewage
- Manage upland water quality

Ocean Oasis

Kelp Forests and Rocky Reefs

On the seafloor, rocky reefs provide habitat for a vast array of plants and animals. Giant Pacific octopus, rockfish and wolf eels set up house for their entire lives, and lingcod tend egg masses and hunt prey under the watchful eye of hungry marine mammals. There is a surprising diversity and abundance of invertebrates on the rocky reefs in our waters.

Above: Male greenling on reef

Right: Rocky reef invertebrates

Bottom: Sealions and kelp

What are kelp forests?

Kelp forests are canopy-forming seaweed communities extending from the sea floor to the water surface. Attached to boulders and rocky reefs, giant kelps grow at least 10-20 m from the seafloor to the water's surface.

Lesser giant kelp and bull kelp form the canopy at the ocean surface with their lush, thick blades. Below the canopy, more seaweed species add to the kelp forest community. Among the fastest growing organisms in the sea, kelps contribute to the base of the food web.

Ocean Oasis

Why are kelp forests and rocky reefs important?

Kelp forests support a complex food web and provide a safe habitat for marine wildlife. These are biodiversity treasure troves and they team with life.

The survival of the endangered sea otter is directly linked to kelp beds as they sleep and hunt among the lesser giant kelp canopy. Sea lions, seals and orca whales patrol the reef/kelp forest boundaries for their prey.

Kelp forest and rocky reef productivity support fisheries and tourism-based economies. Kelp is a rich source of food, pharmaceutical, and health products. Kelp beds protect shoreline beaches and waterfront properties from wave-induced erosion.

Above:
Kelp forest

Right:
Female greenling

Bottom:
Orca whales

Protecting Kelp Forests and Rocky Reefs

Kelp forests need clean water and light to survive. Keeping our ocean waters clean and limiting damaging human activities is important.

- Protect water quality by managing upland wastewater systems
- Avoid kelp forests when boating
- Use oil-absorbing bilge pads
- Locate mooring devices away from kelp beds and reefs
- Avoid anchoring in these sensitive areas
- Respect rockfish conservation areas
- Take action on climate change issues

Salmon Circle – Linking the Land and the Sea

Salmon are iconic symbols of British Columbia and an example of the interconnectedness of the land and the sea.

Starting their lives in freshwater rivers bounded by forests, migrating to estuaries and growing at sea – protecting the salmon circle of life depends on public will. The very waterfront property that you have worked so hard to own, feeds salmon. Shorelines are a salmon migratory highway, providing a key habitat linking the land and the sea.

We are not the only ones who enjoy a picnic at the beach. Tree-dwelling insects transported by winds to the ocean surface link coastal forest, marine riparian vegetation and marine food webs. At high tide, juvenile salmon can be found dining on tasty insects and other prey beneath bent Douglas-fir, arbutus, and alder branches lining the salmon highway.

Marine riparian buffer zones help salmon by filtering pollutants. Stable backshore soils control erosion rates, keeping water sun-lit, high in oxygen, and free of gill-fouling silts.

Healthy shorelines are critical salmon habitats

Salmon, especially Chinook, are heavily dependent on surf smelts, sand lance and herring. These forage fish spawn within metres of the high-tide line. Without these critical forage fishes, many predator species would suffer, including salmon and orca whales.

Fewer little fish mean fewer big fish!

Kelp forests are a spawning ground and a sheltered nursery for many species of juvenile fish, crabs and sea urchins. Kelp forests provide salmon with rich food resources and a hiding place from predators.

Above: Juvenile salmon smolts

Left: Spawning salmon

Bottom: Juvenile salmon smolts feeding at high tide

Did you know?

Tree-dwelling insects, or windfall prey, transported to the ocean surface by winds make up to 50% of the diet of juvenile Chinook. Chinook are critical prey for resident orca whales.

Marine Shorelines as Critical Fish Habitats

Coastal Cutthroat Trout – Linking the Land and the Sea

Coastal cutthroat trout are members of the salmon family and another example of the interconnectedness of the land and the sea. Their numbers have been declining and the BC government considers them vulnerable (blue-listed) to human activities or natural events.

Above;
Sherwood Creek/ Marsh

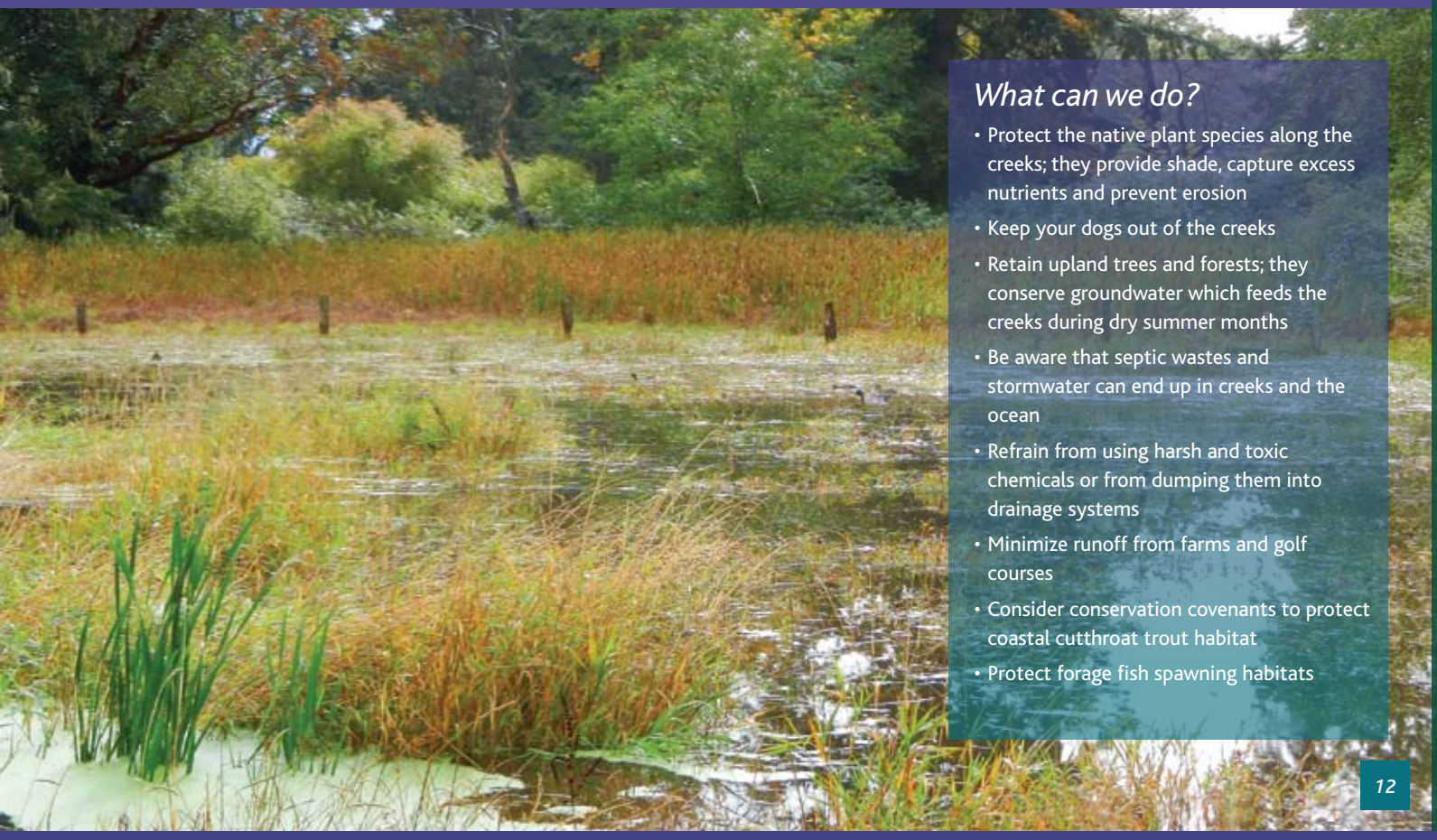
Bottom:
Gooch Marsh

Life cycle

Coastal cutthroat trout use small, shallow creeks that open periodically to the Strait of Juan de Fuca. Their survival depends on cool water, clean gravel beds, and a healthy invertebrate population. They stay in their freshwater creeks for one to three years before migrating into ocean waters. Coastal cutthroat trout can spawn more than once and can live ten years. During their marine life, they inhabit estuaries or the nearshore, feeding on crustaceans and small fish, including surf smelt.

How are they doing?

Many populations are in serious decline and some runs are already extinct. Metchosin is fortunate to have at least two runs which spawn during the winter season in Sherwood and Gooch Creeks.



What can we do?

- Protect the native plant species along the creeks; they provide shade, capture excess nutrients and prevent erosion
- Keep your dogs out of the creeks
- Retain upland trees and forests; they conserve groundwater which feeds the creeks during dry summer months
- Be aware that septic wastes and stormwater can end up in creeks and the ocean
- Refrain from using harsh and toxic chemicals or from dumping them into drainage systems
- Minimize runoff from farms and golf courses
- Consider conservation covenants to protect coastal cutthroat trout habitat
- Protect forage fish spawning habitats

Big Issues, Big Impacts

Shoreline Erosion

Shorelines are constantly changing. Sediment movement, through erosion and wave action, creates the very beaches we cherish.

The removal of shoreline vegetation can result in erosion of waterfront properties. Fighting this erosion by armouring beaches disrupts coastal processes and harms marine ecosystems. Seawalls can increase beach erosion rates and block sediment transport to the beach. Deflected waves scour fine sediment and reflected energy creates more waves, potentially causing seawalls to fail. Over time, beaches become too steep or coarse for people to enjoy.

Nature is the ultimate shoreline engineer. Protection measures using natural materials, such as gravel and sand, logs, and root masses, to absorb wave energy are a better option than hard armouring. These soft-shore engineering methods also protect spawning beaches, eelgrass beds and real estate values.

If you must use hard armouring, set these structures back from the high water mark. Consider predicted sea level rise estimates when designing shoreline protection measures or determining land-use decisions.

Above:Seawall Below: Natural Metchosin shoreline

Shoreline Stewardship Measures – Use Nature's Erosion Controls

- Maintain shoreline vegetative buffers to control erosion
- Trees are your defence against erosion, and they stabilize bank and slope soils. If you need to improve your view, only trim or limb trees
- Think twice about seawalls. Use soft-shore erosion protection methods that work with nature to protect your waterfront

Decrease Your Footprint

- For information about protecting your property, see Coastal Shore Stewardship: A Guide for Planners, Builders and Developers on Canada's Pacific Coast http://stewardshipcentrebc.ca/PDF_docs/StewardshipSeries/Coastal.pdf which is also found in www.greenshores.ca. On page 81 there are examples of how to protect property.
- Take action on climate change issues

Big Issues, Big Impacts

Actions we take now can safeguard marine life for next generations.

Top Left: ***Dunlin feeding in tidepool.***

Left: ***Seal***

Bottom Left: ***Kayaker***

Bottom: ***Weir's Beach.***

Shoreline Stewardship Measures

- Maintain shoreline vegetative buffers
- Use gravel for driveways to reduce storm-water runoff
- Use eco-friendly cleaners
- Stop oil/fuel leaks from cars and boats
- Keep lawn trimmings and other yard debris off the beach
- Eliminate or reduce pesticide and fertilizer use
- Maintain septic systems and use pump-out stations for boat sewage
- Minimize runoff from farms and golf courses for the protection of salt marsh and eelgrass habitats
- Use bilge pads and retire 2-stroke boat engines
- Locate mooring devices away from sensitive habitats

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Page 1: Great blue heron (R. St-Pierre)

Page 2: A Metchosin pocket beach (B.Hall), hooded merganser (R. Murphy)

Page 3: Taylor Beach bluff and Witty's Beach (B. Hall), Pacific sand lance (M. Milne)

Page 4: Witty's Lagoon, Albert Head Lagoon and salt marsh plants (B. Hall)

Page 5: Camas and roots stabilizing slope (B. Hall), Albert Head beach (G. Fletcher)

Page 6: Black oystercatcher (R. St.-Pierre), intertidal invertebrates and sea anemone (M. Milne)

Page 7: Surf smelt and Pacific sand lance (K. Perry), Forage fish monitoring leader, Ramona de Graaf (B. Hall), spawning surf smelt (K. Perry)

Page 8: Eelgrass bed underwater (T. Lightfoot), juvenile copper rockfish (S. Jeffery), eelgrass beach (R. de Graaf)

Page 9: Greenling and rocky reef invertebrates (R. Murphy), sealions (A. Harding)

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Page 12: Sherwood Creek/Marsh (B. Hall), Gooch Marsh (G. Fletcher)

Page 13: Seawall (R. de Graaf), natural Metchosin shoreline (G. Fletcher)

Page 14: Seal, kayaker and Weir's Beach (B. Hall), Dunlin (R. Murphy)

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