Thetis Island

Sustainability Guide

What is the Sustainability Guide?

The Sustainability Guide suggests ways to make your residential construction project more environmentally friendly, reduce its impact on Thetis Island's natural ecosystems and save you money in the long term. It also includes information about financial incentives and other resources that can help you achieve these goals. The Guide is primarily a guidance document to be used as you prepare to build on your property. It can also be used to provide add additional information in an application to the Islands Trust, such as rezoning, development permit, or variance (consult with a planner).

Why on Thetis Island?

Thetis Island is part of the Islands Trust, which has a mandate to preserve and protect the Islands Trust area's unique environment. Both the Islands Trust and the Cowichan Valley Regional District (CVRD) have signed the provincial government's Climate Action Charter, which requires communities to reduce greenhouse gas emissions. One way to do this is through adopting a more sustainable approach to land development and construction. Initiatives you take at the planning stages of your building project can dramatically reduce any negative impacts and help to create a truly sustainable community.

Who should use the Guide?

All current and prospective Thetis Island landowners who are preparing to build a new house, a cottage, or an accessory building, or planning to remodel, renovate or retrofit an existing dwelling. Someone planning driveway construction or re-routing will also benefit from this guide.

When should I use the Guide?

Whether you are applying for a building permit with the CVRD or a rezoning, development permit or variance with Islands Trust, the earlier you consult the Guide, the easier it will be to include its ideas in your project. Review the Guide with your architect, designer and contractor. Consulting the Guide after the working drawings are finished may result in lost opportunities and additional costs if you decide to make last-minute changes.

The Guide has two parts:

Climate Wise Islands

Thetis Island

Sustainability Guide

Part A: Location and Siting Design

Ecosystem Approach to Site Planning:
Know the land

(Official Community Plan (OCP) Section 4 Natural and Heritage Resources Objectives and Policies, Section 6 Development Permits, and Schedule F - Sensitive Ecosystem Mapping)

1. Identify areas with environmental and archaeological values, including habitat for threatened or endangered species and First Nations sites, before planning access, site clearing and design.
2. Locate development — your driveway, septic system, house and outbuildings — away from areas with high environmental values such as shorelines, streams, rare plants, and wildlife trees. Place natural buffers between the development, sensitive features and neighbours.
3. Cluster development in one area of the property to minimize site disturbance.
4. Consider granting a covenant or the Natural Area Protection Tax Exemption Program (NAPTEP) for your property to protect ecological values in perpetuity.

Ecology Tips

Plan ahead: walk the land with your contractor and a local biologist to find environmental benefits and cost savings.

Certain types of First Nations sites are protected under federal and provincial law and must not be disturbed. Avoid the accidental destruction of an ancient site and costly delays and fines by walking the land with an archaeologist before work begins.

A small patch of skunk cabbage or bulrushes in an otherwise dry environment indicates a mini-wetland —an important habitat for amphibians and birds. Clustering buildings and planning short driveways helps the environment and saves money.

Conservation covenants and the Natural Area Protection Tax Exemption Program (NAPTEP) *are registered on title and protect the special aspects of the land that you wish to preserve. They can also give you significant tax benefits.*

Development proposals consistent with the Thetis Island Official Community Plan Bylaw No. 88 (OCP) and the Thetis Island Land Use Bylaw No. 89 (LUB) are supported.

Tree Removal: Think Twice Before You Cut

(OCP Schedule F - Sensitive Ecosystem Mapping)

1. Minimize tree cutting and soil disturbance. Our Island's trees and soils have ecological value and represent important carbon sinks, critical in addressing climate change. When land is cleared for development, its ability to hold on to carbon and keep it out of the atmosphere is lost.

2. Check for eagle or heron nests on your property. These are provincially protected and the Thetis Island Land Use Bylaw No. 89 requires a 100 metre undisturbed buffer around trees containing eagle, osprey or heron nests.

3. Retain and protect significant trees such as Garry oaks and older growth Douglas-fir and cedar.

Tree Tips

Very few old growth cedar or fir remain on Thetis Island. The dominant coastal Douglas-fir ecosystems on Thetis are very rare in the rest of the province. The island's Garry oak meadows are a rare subset of these shrinking ecosystems. These trees have both heritage and ecological value.

Standing dead trees provide important wildlife habitat; leave them standing unless they pose a hazard. Topping is better than felling.

You can create views by limbing taller trees instead of removing them. If you feel trees on your property must be removed to open up a view, cut trees selectively to create a viewscape framed by trees. Consider planting and replacing trees.

Consult an Islands Trust planner before removing trees and vegetation. Special restrictions may apply to tree removal in Development Permit Areas.

Photo credit: for.gov.bc.ca

Water Management: Fresh Water is a Precious Resource

(OCP Section 3 Services Objectives and Policies, Section 4 Natural and Heritage Resources Objectives and Policies, Land Use Bylaw Section 2)

1. Is your property located within a community water system's well capture zone as defined in the OCP? If so, you need to ensure the drinking water supply is not contaminated by malfunctioning septic systems, phosphorus release from soil disturbance, runoff and erosion, and fuel and chemical spills. Design your project to minimize risks to water supplies.
2. Plan to protect trees and vegetation if your property has a stream or wetland.
3. Store rainwater on site by constructing a cistern, tank, pond or wetland.
4. Observe the way water flows over your property and design your landscaping and development in response.
5. No buildings other than a boathouse or pumphouse may be constructed within 30.5 metres of the natural boundary of any watercourse or source of water supply (see the Coastal Waterfront section on a later page for setbacks to the sea). Depending on the location of a property, livestock grazing and solid waste disposal may also be prohibited in areas designated "Water Resources Areas" in the OCP.

Water Management Tips

Thetis Island typically has wet winters and dry summers. Good water management involves retaining the winter rains to recharge groundwater supplies and ponds. Forested slopes, fractured bedrock, and deep organic soils hold moisture. Bare rock and pavement do not. Ensure sufficient topsoil remains on the property and that soil is not left compacted after construction.

Removing trees can result in increased runoff and stormwater damage to properties below. Landowners can be liable for damages caused to a neighbour's property. Plan stormwater retention ponds, drainage swales and wetlands to retain stormwater on site, and maintain existing drainage patterns.

Photo credit: Peter Luckham

Landscaping: Go Native, Avoid Turf

1. Landscape with native, drought hardy vegetation rather than lawns and water demanding ornamentals. Plant more and often!
2. Minimize impervious surfaces and plan to use permeable paving rather than conventional asphalt or concrete.
3. Avoid the use of synthetic pesticides and fertilizers.
4. Plan to control invasive species such as Scotch broom, holly, English Ivy, Himalayan and evergreen blackberry that may be growing on your property.
5. Plan an organic fruit and vegetable garden.

Ecological Landscaping Tips

Avoid non-native plants that spread into and alter our natural ecosystems. The highly invasive Scotch broom originated from three seeds brought from Scotland a century ago.

If turf is to be installed, reduce area as much as possible. Instead of turf grass, consider using drought resistant grass as ground cover.

Pesticides and chemical fertilizers decrease the biological diversity of the soil and are counter-productive to a healthy landscape. Many plant "pest" problems can be addressed by feeding the soil with organic material such as compost.

Growing organic food (or buying local organic food) is one of the best ways to reduce carbon emissions, as well as increasing self-sufficiency.

Photo credit: conservancy.bc.ca

Coastal Waterfront: Be a Shore Steward

(OCP Section 4.1 & Schedule H; Land Use Bylaw Section 2)

1. No buildings other than a boathouse or pumphouse may be constructed within 7.6 metres of the natural boundary of the sea. Locate buildings and structures well away from the shoreline to minimize interference with the shore and the threat of shore line forces.
2. Avoid hardening the shore to minimize interference with natural shoreline processes and loss of coastal habitat. A permit is required for structures adjacent to the natural boundary of the sea, such as those to control shoreline erosion.
3. Use the natural features of the site to protect your property to avoid costly and disruptive shoreline protection measures.
4. Restore, retain and increase the native vegetation along the shoreline to assist with shoreline stabilization and conserving wildlife habitat.

Coastal Waterfront Tips

Know your property boundaries ahead of time, including the high water mark (or legal "natural boundary"). Ocean frontage may have changed since the site was subdivided or last surveyed. You may need to consult with a BC Land Surveyor.

If planning a dock or other marine structure, avoid areas of high biological productivity such as eelgrass or kelp beds, which help to stabilize sand and mud substrates and provide cover and attachment surfaces for fish and invertebrates. To build a dock on the ocean requires an application to provincial Ministry of Forests Lands and Natural Resource Operations.

There are several types of shorelines, each with their own ability to accommodate disturbance. Some are stable and robust; some are fragile and easily destroyed. Find out the type of shoreline along your property. What is its relative stability and its sensitivity to development? Consult with experts in coastal environments.

Photo credit: Peter Luckham

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Part B: Building Design and Construction

Construction Site Management

1. Avoid outdoor burning of slash and wood debris through berming and/or chipping or trucking.
2. Have a construction waste recycling plan and a no-burn policy on site.
3. Protect trees and other natural features during construction.
4. Reduce erosion and sedimentation during construction.

Site Management Tips

Good management significantly reduces the amount of construction waste to be recycled or landfilled.

Branches may be piled densely in alternating layers with other clean wood debris to form a long narrow mound or berm. The material will gradually decompose to form rich soil. Woody berms can be used to slow runoff from a sloping site and to create raised planting beds.

If you've had to cut down large trees, consider milling them on site to use in your project. Wood unsuitable for construction can be cut, split and stored under cover for at least one year before using as firewood.

Clearing ground cover to limit fire spread is recommended for areas close to residential units- this material can be mixed with other compostable materials and returned to the property.

Outdoor burning is strongly discouraged because of local air pollution and greenhouse gas emissions.

Canadian Mortgage and Housing Corporation found that in this climate it was theoretically possible to retrofit a 1969 bungalow to become a net zero energy home by adding insulation (R-50 ceiling, R-26 walls and R-10 slab), high-performance windows, high efficiency lighting and appliances, and a rooftop solar electric (PV) system.

House Design

1. Consider a compact and resource-efficient design to reduce the building's ecological footprint.
2. Use passive solar design principles for space heating and cooling and planned for natural daylighting and natural ventilation.

3. Set performance objectives for your house (e.g. annual consumption targets for water, electricity, firewood and/or propane, or a third party industry standard such as BuiltGreen Platinum or EnerGuide for Homes 85 rating).

4. Use Hot-2000 or similar software to optimize your design for energy performance.

5. Plan a net zero energy house that produces as much energy as it consumes annually.

Design Tips

Good passive solar design is the key to an environmentally sustainable home. By taking the 'House as a System' approach and by setting energy and water consumption targets, you can create a healthy, comfortable and efficient sustainable home.

Match south-facing window areas with interior mass (e.g. concrete or tile floors, masonry feature walls, plaster or thick drywall) to store passive solar gains and reduce temperature swings. Avoid large areas of non-south glazing and large skylights; they cause overheating and glare during the summer and lose heat during the winter.

Use of Hot-2000 or equivalent modelling software at the preliminary design stage can result in major energy and cost savings. Re-running the program at the working drawing stage can help fine-tune your plans.

A near net zero energy house is feasible using current technology. The Canada Mortgage and Housing Corporation found that in this climate it was theoretically possible to retrofit a 1969 bungalow to become a net zero energy home by adding insulation (R-50 ceiling, R-26 walls and R-10 slab), high-performance windows, high efficiency lighting and appliances, and a rooftop solar electric (PV) system.

Building Materials

1. Use foundation options that will provide good thermal performance and water resistance, and efficient resource use.

2. Use resource efficient framing and wall options that optimise structural and thermal performance and reduce environmental impact.

3. Use more insulation, insulation with recycled content, and windows with a higher energy rating than required in this area by the BC Building Code.

Building Materials Tips

Foundation options include fabric forms, foundation drainage membranes, insulated concrete forms (ICF), and portland cement substitutes such as fly ash.

Above grade, raised heel trusses, advanced framing techniques (e.g. 24" centres, elimination of non-bearing double headers), sustainably harvested FSC certified wood, structural insulated panels (SIPS), and insulated rammed earth walls may be appropriate choices, depending on the building design.

Provide a continuous air barrier. Air leakage through cracks, e.g. around beams and trim, significantly reduces energy performance. A blower door test towards the end of construction will identify unintentional air leakage paths, and is required if the house is to be rated.

Various techniques and materials may be used to reduce a home's ecological footprint, but determining the best solution is not always straightforward. Depending on the circumstances, a 'high-tech' wall system using fossil fuel derived products may, or may not, score better than a conventional well-insulated wall, or a wall system built of natural materials. Ask your designer which techniques are appropriate for your home. Materials must be compatible with the design and with other building systems, plus meet performance objectives.

The building code is a minimum standard. Adding insulation reduces operating energy costs and increases comfort.

Mechanical and Electrical Systems

1. Use heat pump technologies for space heating such as ground, water, or air source heat pumps, including air source ductless systems if justified by heat loads.
2. Install a central heat recovery ventilator system.
3. Install a high efficiency wood burning appliance, pellet stove, or efficient propane gas fireplace rather than a conventional fireplace.
4. Purchase EnergyStar appliances.

Mechanical System Tips

Heat pumps are excellent where heat loads are large, as in older houses and large new homes. If your house is compact and well-insulated, the space heating loads may be too small to justify a heat pump; electric baseboard heaters may be the best solution. Radiant floor distribution systems can circulate hot water from various sources boiler, heat pump, solar system — and provide even, dust-free silent heat. They do not necessarily save energy. Central heat recovery ventilation (HRV) systems control humidity and ensure good indoor air quality.

Greywater or drain-water heat recovery systems can recover heat from the hot water used in showers, bathtubs, sinks, dishwashers, and clothes washers.

Always burn dry wood that has been seasoned under cover for at least one year. A conventional open fireplace wastes energy and creates air pollution. Low emissions wood stoves and fireplaces not only produce less air pollution — they're more efficient, heating your house with less wood.

Water Conservation

1. Consider harvesting rainwater from roofs and storing it in tanks, cisterns, and/or ponds.
2. Use dual flush toilets, low flow shower heads and faucet aerators.
3. Use greywater separation and treatment for irrigation or reuse.

Water Conservation Tips

Rainwater collected from the roof can be more than sufficient to meet annual household needs. 100 sq. m. of roof yields 86,000 litres, given 86 cm annual rainfall. Rainwater may be used for toilet flushing, laundry and garden irrigation. After treatment, rainwater may be used for all household needs, including drinking water. Install a metal, slate or clay tile roof if you plan to use rainwater for potable water and check with the Vancouver Island Health Authority (VIHA) for current regulations.

Dual flush toilets give the option of using only three litres per flush.

Low flow shower heads vary in water consumption from about two litres per minute to six litres per minute. Read the fine print before you buy.

Greywater from laundry, showers and baths can be filtered and treated for reuse to flush toilet, or water gardens. Commercial systems are approved for use in BC.

A waterless composting toilet is permitted and is the ultimate water saving device, but a septic system must still be installed to handle wastewater, grease and food debris from kitchen sinks, and to meet regulatory requirements. A registered practitioner is required to design and install residential wastewater systems in BC.

Interior and Exterior Finishes

1. Use roofing materials suitable for rainwater harvesting for potable use.
2. Source local wood and stone where possible to reduce transportation energy.
3. Use low maintenance exterior cladding and trim to reduce the need for paint and stain.
4. Use environmentally friendly, water soluble low-VOC paints and finishes.
5. Use materials with recycled content.

Finishing Materials Tips

Local materials, such as stone, sustainably harvested wood, and locally sourced natural earth plasters, are nontoxic, have low embodied energy, and often are very attractive.

Natural, non-toxic and low VOC paints and coatings are now widely available and labelled as such.

Many products are available with recycled content, for example, roofing, interior doors, ceramic tiles, and carpets. Ask your building supplier.

Natural linoleum, bamboo and cork are three of many greener alternatives to vinyl flooring.

Renewable Energy

1. Install a clothesline.
2. Install a solar water heating system.
3. Consider a photovoltaic system. Roof-mounted photovoltaic (PV) panels can provide enough electricity from the sun to run an energy efficient home or cottage during summer months. A single panel can pump water from a pond to a garden irrigation system, or power a computer and emergency lights.

Renewable Energy Tips

The clothesline is one of the simplest solar technologies, and a good way to save energy.

An unshaded south-facing roof and space for a solar preheat tank are the prerequisites for a solar hot water system. A solar water heater can supply up to 60% of your annual domestic hot water energy needs. Provincial and federal grants may be available to offset some of the initial costs.

If your PV, or wind energy system is connected to BC Hydro, whenever the system generates excess electricity you can "run the meter backwards," to reduce your electricity bill. Contact BC Hydro, or a qualified installer for details on net metering.

Maintenance

1. Schedule annual cleaning for chimneys and regular inspection and servicing for mechanical equipment, including water treatment equipment.
2. Occasionally inspect the outside of your home during, or just after, heavy rain to check for any drainage problems such as blocked eaves troughs.
3. Purchase environmentally friendly cleaning products and use organic gardening methods.
4. Recycle all household recyclables and compost garden and kitchen waste.

Home Operating Tips

Careful use can typically reduce energy and water consumption in a home by 10% to 20%. Use programmable thermostats to set back the temperature at night and when the house is unoccupied. Remind family members about energy and water conservation, and "turn it off".

An "operating manual" or binder with equipment and materials information, along with a photographic record of construction and list of trades used will be very helpful long after construction's done.

Schedule regular servicing activities, such as filter cleaning or replacement, and chimney and eaves trough cleaning, into the household calendar. Filters include air filters on furnaces and screens on air intakes, and filters on home water purification systems.

Keep a schedule for infrequent tasks, such as exterior painting and septic tank pump outs. Postponing these tasks can lead to serious problems and major, expensive repairs.

Baking soda and vinegar work just as well as commercial cleaners for many household cleaning jobs and are better for the environment.

Dimmers and timers are a simple and inexpensive way to increase the lifespan of light bulbs and reduce energy use.

Plan to drive less. Automobiles are a major source of local air and noise pollution on Thetis Island, and are the largest single contributor to Thetis's greenhouse gas emissions. Reduced automobile dependence is an island objective.

Tackle one guideline at a time – each one is a step closer to a more sustainable development.

Resources

Home Labelling Programs

If you would like assurance that your house meets current greenbuilding standards, you can get your home certified by an independent third party. Several home labelling systems are currently used in Canada, including Energy Star, LEED® Canada for homes, R-2000, and BuiltGreen™. These labels all use the same "Hot-2000" software for energy analysis. These are the available options in BC:

R-2000 CHBA-BC
www.chbabc.org/
1-800-933-6777

BuiltGreen™ BC CHBA-BC
www.chbabc.org/
1-800-231-1336

LEED® Canada for Homes
www.cagbc.org
866-941-1184

Home Retrofit Labelling Programs

EcoEnergy for houses CityGreen
www.citygreen.ca
1-866-381-9995

Grants

Some federal, provincial and CVRD grants are available for energy & water conservation. The following were current at time of publication, check for additional grants with CVRD and CityGreen.

BC Hydro Power Smart Rebates
See BC Hydro's website for current incentives and discount coupons.
www.bchydro.com/powersmart

Solar BC
$1,000 point-of-sale discount (plus a further $625 EcoEnergy/Live SmartBC rebate) towards a solar hot water system.
www.solarbc.ca
1-866-650-6527

EcoEnergy / Live Smart BC provide grants to homeowners and landlords upgrading existing homes for energy efficiency and some renewable energy and water conservation measures.

Solplan Review is the independent Canadian journal of energy conservation, building science and construction practice for residential construction.
604-689-1841

BC Sustainable Energy Association
www.bcsea.org

Lighthouse Sustainable Building Centre
www.sustainablebuildingcentre.com

Water

Vancouver Island Health Authority
Jurisdiction over water quality
http://www.viha.ca/mho/water/

Islands Trust Fund
Rainwater Harvesting on the Gulf Islands, a series of publications, including project schematics and links.
www.islandstrustfund.bc.ca

Rainwater Connection
www.rainwaterconnection.com

Water Tiger
www.watertiger.net

Land Development

BC Ministry of Environment
Develop with Care 2012 online manual
http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2012/index.html

Energy and Buildings

Canadian Mortgage and Housing Corporation: CMHC www.cmhc-schl.gc.ca/en/**Natural Resources Canada**

NRCan www.oee.nrcan.gc.ca

CityGreen: www.citygreen.ca; 1-866-381-9995

Waterfront Management

Greenshores
http://www.greenshores.ca/

Coastal Shore Stewardship: A Guide for Planners, Builders and Developers on Canada's Pacific Coast: http://www.greenshores.ca/sites/greenshores/documents/media/105.pdf

Caring for Our Shores: A Handbook for Coastal Landowners in the Strait of Georgia
http://www.cowichanlandtrust.ca/content/caring-our-shores

Conservation Covenants

TLC-The Land Conservancy of BC
www.conservancy.bc.ca

Islands Trust Fund
www.islandstrustfund.bc.ca

Local Resources

The following organizations have information and programs to assist residents in reducing our ecological footprints:

Island Natural Growers
information on organic farming & gardening
www.cog.ca/ing/index.htm

Thetis Island Community Association
www.thetisisland.net

Islands Trust
700 North Road
Gabriola Island BC V0R 1X3
Phone: 250.247.2063
Fax: 250.247.7514
northinfo@islandstrust.bc.ca
www.islandstrust.bc.ca

CVRD
175 Ingram Street
Duncan BC V9L 1N8
Building Inspection (Gulf Islands)
Phone: 250.746.2620
Fax: 250.746.2621
www.cvrd.bc.ca

Thank you for reading the Thetis Island Sustainability Guide.
Please let us know if this Guide was helpful to you, and how it can be improved.
***The Thetis Island Sustainability Guide** is downloadable at: www.islandstrust.bc.ca*