

FOCI Climate Adaptation and Mitigation Project

Recommendations for Revisions to the Cortes Island Official Community Plan

Background/Context

The Official Community Plan (OCP) for Cortes Island, known as bylaw NO.139, was officially adopted on February 28th, 2013¹.

In many ways, the 2013 OCP was impressively progressive in its understanding and reference to climate change and environmental issues, however, much of its vision was either never carried out or lacked specificity. Any update to the community plan should consider ways in which the original values of the OCP can be better supported, expanded upon and strengthened, in order to make the Cortes community a beacon of coastal climate action and adaptation.

The limited progress toward the visionary goals in the 2013 OCP can be linked to many causes. One overarching explanation could be that all lofty goals are run through the filter of culture and the dominant culture has still not prioritized climate, the more-than-human world, or the impact these two have on human systems. We need our OCP to be the guiding document that it is meant to be – regularly citizen-powered reminders of our vision is likely the main solution here.

It is the purpose of this report to offer recommendations for strengthening the OCP’s climate change planning. This report understands climate change as the central threat of our time, and follows the International Panel on Climate Change (IPCC) in pressing for urgent action on both climate mitigation (reducing pollution) and adaptation (surviving the effects of pollution) measures in order to have some chance of acting within the “brief and rapidly closing window to secure a liveable future”².

Given this context, it is the recommendation of FOCI that all community planning decisions be seen through the lens of climate responsibility. By identifying areas the OCP must address, the community planning will be guided in adapting to warming which has already occurred and will continue. This report will move through the areas most important to climate mitigation and adaptation, making recommendations throughout. It will begin with a discussion of the OCP’s Vision and Goals, before making recommendations for climate mitigation, including the creation and implementation of a community energy transition plan. It will then move on to address areas critical to the process of climate adaptation: disaster preparedness, land use, food security, the protection and restoration of natural systems and the mapping of natural assets.

¹ Bylaw No. 139, being Cortes Island Official Community Plan Bylaw. Strathcona Regional District. 2013.

² IPCC. *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. 2022. <https://www.ipcc.ch/report/ar6/wg2/>.

OCP review, by sections

First Nations

One of the First sections in the OCP is about First Nations and the aspirations to have healthy indigenous-settler relations and support local first nations goals.

The OCP states, “It is acknowledged that Aboriginal rights and title may be affected by both coastal and upland developments and they must be taken into account as part of the Strathcona Regional District’s Official Community Plan review process.”

This gravely understates the situation as we understand it now in 2023.

Non-indigenous gov’ts and citizens have a constitutional duty to not undermine aboriginal culture and nutritional/economic resources³⁴. Climate change is already undermining the health of many of these critical resources. And the current business-as-usual trajectory is intending to risk the already-depleted stocks of salmon, Cedar, and risk the existence of shellfish, among other threats.

In the OCP, honesty must be mustered to acknowledge that various levels of gov’t have infringed upon fundamental aboriginal rights and title – and they will continue to do so until climate pollution is no longer being emitted by our community and the non-indigenous residents stand to defend indigenous rights alongside our indigenous hosts. Reducing carbon pollution as deeply and quickly as possible must be clearly stated as a constitutional and physical necessity.

We recommend that language to this effect be included in the First Nations context section.

Vision and Goals

OCP begins its vision for the island with the goal of a sustainable future (301, p.12), but does not mention climate change as the greatest threat to this vision. Its discussion of principles does include the adoption “of strategies intended to limit climate change” (303, L, p.13). This language should be strengthened to address the increased clarity of the science, the increased precariousness of the situation, and the increased urgency and scale of response required. Although the OCP contains several principles regarding the protection of ecological systems, drinking water and food security which are crucial to the task of climate adaptation, such as principles *d*, *e*, *g*, *i*, *j*, *k* and *n*, the OCP does not include specific reference to climate adaptation in its plan.

It is the recommendation of this report that the OCP be amended to include the principle of adapting to present and future impacts of climate change, including increased events of droughts, wildfires, storms and sea level rise.

³ https://en.wikipedia.org/wiki/Section_35_of_the_Constitution_Act,_1982

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https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

Furthermore, this report recommends that the Strathcona Regional District (SRD) join the growing list of jurisdictions around the world in declaring a climate emergency. And given this emergency, climate justice, mitigation and adaptation should become lenses through which all decisions are made. This should be adopted as a fundamental vision and principle of the OCP.

Additionally, all elected officials and employees involved in community decision-making should be required to undertake climate awareness training and consider climate responsibility, similar to how fiscal responsibility must be weighed in all decisions currently. This would include the facilitators of the OCP review process. The facilitators of the review process need to have a firm understanding of the climate context in order to properly perform this function.

A principle of climate responsibility should include responsibilities to current islanders, who are already feeling the impacts of climate change, responsibilities to those in the global south who will be disproportionately affected by our emissions, responsibilities to future generations and responsibilities to non-human entities which also have the right to exist but are impacted by our emissions.

While the OCP hints at the need for biocentric values beyond what is simply good for humanity: “To emphasize our respect for all forms of life and the need to protect biodiversity and the health of the environment;” (303, *J*, p. 13), this falls short of formally recognizing the legal standing of the more-than-human world. This report recommends that the OCP follow communities, municipalities and countries all around the world in formally recognizing the rights of nature. It is critically important that the Klahoose, Homolco and Tla’amin nations be given ample opportunity to consult on the wording of any declared rights of nature.

The rights of nature is a global movement which manifests differently across the world to establish legal mechanisms to protect nature grounded in local place-based understandings of reciprocity with the landscape and the inherent value of the natural world. The rights of nature include such rights as “the right against extinction” and “the right against the degradation of natural cycles which sustain the ecosystem”. These laws have been identified by legal experts as being highly useful in the fight to limit and adapt to climate change⁵.

The rights of nature can also be used to empower local citizens with the ability and responsibility to initiate legal proceedings against individuals and corporations which violate nature’s rights. As such, asserting the rights of nature would foster norms of responsibility to the watershed and move towards empowering islanders with the ability to protect the island’s natural assets (including from climate change).

Recommendations:

- ***Include climate adaptation and mitigation as governing principles (in line with the Paris Agreement)***
- ***Declare a climate emergency***

⁵ David R Boyd, *The Rights of Nature : A Legal Revolution That Could Save the World* (Toronto: Ecw Press, 2017).

- *Include the principle of climate responsibility in all decisions, so that all decision making is done through the lens of climate mitigation and adaptation.*
- *Require climate change awareness training for all elected officials and employees involved in community planning.*
- *Support the creation of a Cortes Community Climate Adaptation and Mitigation Plan*
- *Prioritize the creation of high-quality ecological restoration, stewardship and fire mitigation employment opportunities for locals.*
- *Work with First Nations to pursue the adoption of the Rights of Nature as an official community policy.*

Climate Mitigation

The 2013 OCP was admirable in its acknowledgement of Cortes' need and responsibility to reduce emissions, stating a goal of reducing greenhouse gas (GHG) emissions 16% by 2020 and 40% by 2050 (OCP, 404.2, L, p.22). It is highly unlikely that this goal has been met. The secondary goal of a 40% reduction is still possible, although extremely insufficient for a safe planet. **This report recommends the adoption of an ambitious target in line with a fair-share of the global carbon budget as assessed by the IPCC – zero emissions by 2030, including upstream and downstream⁶.**

This goal may seem extreme, and it is. Unfortunately, the problem has been left too late and now we have only extreme options. We can reduce pollution slowly and stray into geologically uncharted territory, risking the health and safety of all life on earth, permanently; or we can slow down, transition fast, and do what is scientifically and morally required.⁷.

Local efforts will have to be made alongside and in tandem with systems level government changes in order to meet this goal and ensure that we do our part in the global effort to limit catastrophic warming.

Most methods for identifying and mitigating GHGs take a geographic boundary for an emissions inventory. While there are advantages to that approach, a 'consumption emissions' approach counts the upstream and downstream emissions from a community or individual or nation as part of its responsibility⁸. Much of human life on Cortes is supported by actions and processes that occur off of Cortes. This report recommends taking a broad view of emissions under the responsibility of this OCP – and that requires taking a consumption-based inventory of emissions.

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<https://rosagalvez.ca/en/initiatives/climate-accountability/canada-s-fair-share-of-emissions-reductions-under-the-paris-agreement/>

⁷ UN IPCC **Climate Change 2022: Mitigation of Climate Change**
<https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/>.

⁸ https://en.wikipedia.org/wiki/Greenhouse_gas_inventory#Consumption-based_accounting

It is worth noting here, that emissions inventories should not be held as a pre-requisite for taking action – much of the work that needs doing can be done with what we already know and can assume.

The speed and scale of changes required is quite monumental – it is an emergency situation. This report recommends that the OCP call for a declaration of climate emergency. This will help to reallocate existing resources and seek others. What needs doing cannot be achieved with current staffing positions and resource levels.

The emissions reduction targets set in the OCP need to be communicated regularly by multiple sectors of society. One of the causes of ‘our’ failure to address climate change is that we have words and policies written down, but no sense of urgency or repeat messaging from diverse leaders at various levels within society. The OCP needs to call on all levels of our elected leadership and bureaucracy to be informed and communicate the emergency – from the manager of Parks to the Fire Chief. Everything we care about is at risk. The truth will only be understood when it is repeated and felt.

Given an emergency declaration, resources should be reallocated to create multiple full-time staff positions to develop initiatives, assess progress, communicate the problem, communicate with local stakeholders, connect with and lobby other levels of government and other regional gov’ts, and execute mitigation and adaptation initiatives.

This OCP recommendations report cannot list all the mitigation and adaptation opportunities, partly for lack of resources, and partly because the people of Cortes need to make some of those decisions. Emergency resources devoted to climate change are therefore critical to developing and implementing a detailed plan.

Similarly, the OCP process itself represents a great opportunity for community consultation on mitigation and adaptation measures and communicating the problem. The next phase of our community plan should be a climate adaptation and mitigation plan. As the UN IPCC says, **“Any further delay in concerted anticipatory global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all. (very high confidence)”**

The OCP must fully support efforts to eliminate its largest sources of emissions: land transportation, the import of construction materials and food, the ferry and non-electric building heating.⁹

Critical to this process will be the development and implementation of an Energy Transition for Cortes. Key aspects of such a plan should be working with the SRD, friends of Cortes Island (FOCI), the Cortes Community Forestry Partnership and the Cortes Community Foundation to assist islanders in accessing green home retrofit rebates, and helping to bring contractors with the appropriate qualifications to the island to assist islanders in improving home insulation and the

⁹ Cortes Carbon Solutions, “CORTES CLIMATE ACTION INITIATIVE,” 2010.

installation of heat pumps. This will reduce emissions from firewood burning and ease pressure on the Community Forest Partnership to provide firewood.

The OCP needs to prioritize reducing transportation emissions. We need public transport, ride sharing, electric bicycles and charging infrastructure for EVs. This recommendation is in alignment with 2013 OCP objective 401.1.k (p.18), which recommended the construction of EV charging infrastructure. Future objectives should include working with the SRD and Cortes organizations to ensure progress is made on this goal. The Gorge Harbour Marina, Cortes Natural Foods Coop and Squirrel Cove General Store are potential locations, although input from the community on this decision should be encouraged.

The greatest single task of an energy transition will be assisting in the electrification of the Quadra-Cortes Ferry. BC Ferries currently has plans to implement a hybrid electric-marine diesel “Island Class” ferry on our route in 2028. The Island Class ferries are also designed with the deck space to install additional batteries, with the goal of eventually fully electrifying them¹⁰. However, BC Ferries has no timeline for full electrification, with the greatest obstacle being the construction of shore-charging infrastructure and has noted that it is working with the Federal and Provincial governments to secure additional funding to offset the costs of the project before it proceeds^{11,12}. The ferry currently emits 982 tonnes of CO2 per year¹³. This will be reduced by the Island Class ferry, but so long as such a frequent service relies on marine diesel the island will not reach the goal of net-zero carbon emissions by 2030. As such, this report recommends the community make it a priority to work with the SRD and BC Ferries and NGOs to secure additional funding to create a timeline for, and expedite the construction of, electric shore-charging infrastructure.

The 2013 OCP made the construction of clean energy a priority. It says the community should: “encourage and support the implementation of local clean/renewable energy initiatives.” (304.4,I,p.15). And suggests “Explor[ing] options to diversify the Cortes Island’s energy supply via renewable energy options such as solar, photovoltaic, solar hot water, bio-fuel, and heat pumps;” and “Initiat[ing] requirements/incentives for the installation of solar hot water panels for residential homes;” (p. 22). However, no such incentives or requirements have been put in place. No significant action has been taken to encourage the construction of community solar, wind and small-scale hydro projects. There is opportunity here to reiterate these goals as well as to reflect on how to make an OCP more effective in actually steering the direction of a community.

The OCP should also support efforts to make Islanders aware that they can gain “generation credits” for extra energy generated from possible private renewable energy sources, through BC

¹⁰ “Island Class Ferries 2022 | BC Ferries,” www.bcferries.com, 2022,

<https://www.bcferries.com/in-the-community/projects/island-class-ferries>.

¹¹ Bruce Buls, “New Hybrid-Electric Ferries Provide Bridge to Zero Emissions,” www.workboat.com, 2022,

<https://www.workboat.com/shipbuilding/new-hybrid-electric-ferries-provide-bridge-to-zero-emissions>.

¹² Greg Osoba, “BC Ferries Calls on Shipyards to Bid on Construction of Four New Vessels | Cortes Radio,” cortesradio.ca, 2022,

<https://cortesradio.ca/bc-ferries-calls-on-shipyards-to-bid-on-construction-of-four-new-vessels/>.

¹³ Berman-Hatch, Forrest. “Carbon Footprint of Travel to Cortes.” Friends of Cortes Island. 2022.

Hydro’s “net metering” program, while still relying on BC Hydro’s grid when they need. At a community level, the OCP should encourage exploration into combined wind and solar battery projects and community solar gardens, while also monitoring progress on lowering costs and potential advances in tidal power technology. While this is an important goal, most islanders are already connected to BC hydro’s low carbon grid, as such it should be seen as a lower priority than eliminating emissions from personal transportation, the ferry travel and wood burning (through heat pumps and green retrofits), and upstream and downstream emissions.

Pollution Mitigation Recommendations

- *Adopt science based, fair-share climate target, per Paris Agreement¹⁴15.*
- *OCP officially adopts an energy transition as a guiding principle and goal.*
- *Creation of an energy transition plan*
- *Support green retrofits and heat pump installation.*
- *Expedite the planning and construction of shore charging infrastructure for the Island Class ferry.*
- *Support community level or private renewable energy initiatives.*

Disaster Preparedness

Wildfires

Amendments to the OCP should follow coastal communities such as Saltspring Island in identifying wildfires as the most extreme and dangerous climate-threat¹⁶. The OCP should also strongly acknowledge the importance of the Cortes Island Fire Fighting Association’s (CIFFA) to island fire safety, and how the local knowledge of members enables it to address community needs and plan for wildfire safety.

This report recommends that the community support objectives of the existing SRD and CIFFA Cortes Community Wildfire Protection Plan (CCWPP).

The 2013 OCP recommended the creation of a community evacuation plan (407.2, J, p. 32). The CIFFA has worked with the SRD to develop a community wildfire evacuation plan. They also worked to provide volunteers with wildfire training and increase the CIFFA interface and wildland firefighting tools and PPE¹⁷. This represents a serious step forward in climate adaptation and disaster preparedness. Amendments to OCP should fully support the recommendations contained within the Cortes Community Wildfire Protection Plan, including

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<https://rosagalvez.ca/en/initiatives/climate-accountability/canada-s-fair-share-of-emissions-reductions-under-the-pari-s-agreement/>

¹⁵ https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

¹⁶ Transition Saltspring Society, “Saltspring Climate Action Plan,” Transition Saltspring Society, 2022, <https://transitionsaltspring.com/wp-content/uploads/2021/01/1.-CAP-2.0-COMplete-Web.pdf>.

¹⁷ Debrah Zemenak, “Strathcona Regional District Electoral Area B: Cortes Island Community Wildfire Protection Plan 2020 Update,” 2021.

the creation of an evacuation information pamphlet and increase education around the evacuation plan and the FireSmart education campaign, and encouraging the installation of cost-effective roof top sprinklers used in interior BC¹⁸.

The OCP should also support efforts to refine and improve the plan and better prepare the island for wildfire response. The CCWPP states “climate scientists expect that the warming global climate will trend towards wildfires that are increasingly larger, more intense and difficult to control. Furthermore, it is likely that these fires will be more threatening to WUI communities due to increased potential fire behaviour, fire season length, and fire severity.” The plan however does not list any recommendations to reduce the extent of climate pollution. This represents a major shortfall. Cortes is currently in a ‘moderate risk’ and the risk will increase with climate change that is already coming from past pollution ([BC risk map](#)). To omit the importance of reducing that pollution is dangerous. The window within which to keep warming below high-risk thresholds is closing quickly, which means that the fire risk could become extreme if mitigation measures are not taken swiftly.

Climate emergency communication is important for mitigation, and a significant opportunity for leadership from firefighters exists. Firefighters hold a respected position in society that crosses political leanings and biases, and so messaging on climate coming from the CIFFA would be particularly helpful in building community momentum for climate change mitigation and adaptation.

A high priority should be placed on working with the SRD and local NGOs such as the Cortes Community Foundation to provide funding for the purchase of a structural protection unit (SPU). Furthermore, it should be made a priority to build high-volume water tanks at strategic locations identified in the CWPP and encourage the restoration and water retention of natural water sources.

In tandem with seriously addressing wildfire response, the OCP should support efforts to mitigate fire risk, such as working with the SRD and BC Hydro to brush areas identified for fire risk, thereby removing wildfire fuel, as recommended in the CWPP¹⁹, as well as identify additional areas which would be beneficial. Such opportunities also serve the purpose of creating ecological stewardship jobs for locals.

The OCP should also reference the possibility of working with the Strathcona Regional School District and Cortes Island school to get local children involved in wildfire suppression and wildfire forest stewardship, through in school planning or summer programs, as is currently done as a part of the community of Logan Lake, BC, FireSmart program²⁰. Youth could be issued a

¹⁸ Jim Elliot, “B.C. Inventor Creates Rooftop Sprinklers to Protect from Wildfires - Vancouver Island Free Daily,” www.vancouverislandfreedaily.com, April 26, 2019, <https://www.vancouverislandfreedaily.com/business/b-c-inventor-creates-rooftop-sprinklers-to-protect-from-wildfires/>.

¹⁹ Debrah Zemenak, “Strathcona Regional District Electoral Area B: Cortes Island Community Wildfire Protection Plan 2020 Update,” 2021.

²⁰ District of Logan Lake, “FireSmart Program : District of Logan Lake,” loganlake.ca, accessed January 28, 2023, <https://loganlake.ca/your-municipality/firesmart-program/>.

FireSmart certification, and then could offer their skills to property owners to assist in preparing their properties to better handle wildfires and limit the risk of fire spreading, in accordance with item 26 of the CWPP²¹. Such a program would empower youth and increase their employable skills. Further education could include outreach to islanders and encouraging them to participate in annual S100 wildfire training (a one-day course), to enlarge the volunteer capacity of the island in event of a wildfire.

This sort of youth engagement leads naturally to the creation of a youth climate corps¹⁶. The CIFFA, with stable taxpayer funding service, is an ideal home for a youth work program that puts Cortes young people to work reducing hazards, restoring habitats, making homes safer, more comfortable and affordable – while reducing our greenhouse gas emissions.

The OCP should also encourage the facilitation of a one-day FireSmart course for island construction, home renovation and landscaping contractors.

Another way for the OCP to support wildfire preparedness would be to acknowledge the co-benefits of wetland restoration with wildfire prevention and mitigation, supporting the work of wetland restoration on Cortes. The SRD, CIFFA and members of FOCI's Dillon Creek Restoration Project should be supported in identifying areas where restored wetlands and decanalized ditches could act as a fire guard, or enhance pumping capabilities.

Work with Transitions Salt Spring and their on-going research with UBC to establish better recommendations for landowners in heavily forested areas.

Wildfire Recommendations

- ***Acknowledge the work and importance of the local knowledge provided by CIFFA to the island community.***
- ***Add climate mitigation and adaptation measures to the CCWPP***
- ***Acknowledge wildfires as a severe and increasing climate threat. Establish communication plan to spread the message; coordinate with various stakeholders on messaging.***
- ***Acknowledge the co-benefits of wetland restoration with wildfire prevention and response.***
- ***Support the recommendations of the Cortes Community Wildfire Protection plan including;***
- ***Working with the SRD to raise awareness around the Cortes Evacuation plan and educate islanders surrounding FireSmart.***
- ***Support islanders in installing FireSmart appliances such as roof sprinklers.***

²¹Debrah Zemenak, "Strathcona Regional District Electoral Area B: Cortes Island Community Wildfire Protection Plan 2020 Update," 2021, p. xi

¹⁶description of youth climate corps, accessed March 30, 2023 <https://www.climateemergencyunit.ca/climatecorps>

- *Work with Strathcona Regional School District and Cortes Island School to provide FireSmart training to students, with the potential for summer programs and jobs for forest stewardship and wildfire prevention.*
- *Educate islanders on opportunities to undertake S100 training.*
- *Facilitate FireSmart workshops for contractors.*
- *Create youth climate corps*

Heat Waves

Amendments to the OCP should acknowledge the increasing risk extreme heat events pose to our community in the climate era. The 2021 heat dome, "[the most deadly weather event in Canadian history](#)", resulted in the deaths of at least 619 people²². Extreme heat events such as this are predicted to occur every 3-10 years by 2050 and worsen in intensity²³. That is due to global heating from past pollution.

Amendments to the OCP should encourage the creation of a plan to work with the Cortes Community Health Centre, the Community Halls, the SRD, and the Cortes Island Seniors Society to create cooling centres and a heat wave response plan in accordance with provincial recommendations. Manson's hall already offered cooling services, and this should be formalized, developed and funded, and expanded to other parts of the island.

The OCP should also support the creation of a call-list, including seniors and others vulnerable to level 2 heat events, such as substance and medication users. This list could be used in tandem with a notification alert system, such as the "Voyent Alert!" system used by Ashcroft, BC²⁴, for level 2 heat events, in accordance with the BC Heat Alert Response System²⁵. An additional call-list of volunteers who are willing to transport seniors and at-risk individuals to cooling centres in event of a dangerous heat wave should also be created. This report also recommends the OCP include a goal of working with the National HealthADAPT community of practice framework for climate adaptation, to share knowledge and receive possible funding.

²² Government of Canada, "Surviving the Heat: The Impacts of the 2021 Western Heat Dome in Canada," Science.gc.ca. Government of Canada, 2022.
<https://science.gc.ca/site/science/en/blogs/science-health/surviving-heat-impacts-2021-western-heat-dome-canada>.

²³ Province of British Columbia. BC Climate Risk Assessment Summary. 2019.
www2.gov.bc.ca/assets/gov/environment/climatechange/adaptation/climate-risk-summary.pdf;
<https://www.canada.ca/en/health-canada/services/climate-change-health/extreme-heat.html>

²⁴ . Lubnik et al, 2022. "BC Provincial Heat Alert and Response System (BC HARS): 2022," www.bccdc.ca, 2022,
<http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/Provincial-Heat-Alerting-Response-System.pdf>. p.20

Heat Wave Recommendations

- ***Support working with the SRD, Cortes Community Health Centre, community halls, the SRD and the Cortes Island Seniors Society to raise funds to create an on-island cooling center.***
- ***Support creation of a call-list of seniors and other individuals at risk in extreme heat events.***
- ***Support creation of a second call-list of volunteers who would be willing to transport seniors to the cooling centre. List could be used in tandem with a notification system to notify islanders of impending heat warnings.***
- ***leverage risk of heatwave, and community responses, to build support for climate mitigation.***

Droughts

The intensity, duration and frequency of droughts are predicted to increase with climate change²⁶.

Drought Recommendations

- ***Support public education on droughts and water usage.***
- ***Support and encourage rainwater catchment systems in accordance with original OCP.***
- ***Support a hydrological study of Cortes, in accordance with original OCP action item 5 (602, 5, p. 61) with specific goal of understanding the watershed's ability to deal with drought.***
- ***Create a threshold for water limitation, e.g drought protocols where water is used for critical use of drinking and crucial crop watering only, to limit likelihood of depleting aquifers, particularly on the south end where provincial map notes the aquifers recharge slower.***
- ***Acknowledge the co-benefits of wetland restoration with watershed water retention and drought mitigation.***

Land Use

The 2013 OCP is missing maps. Land use planning should be based largely on geography and ecology, followed by community need and accessibility. This report recommends identifying culturally and ecologically important areas, including their connectivity. We further recommend identifying the variations in the water-supply and waste absorbing capacity of different parts of the island. We should be making land-use decisions grounded on the reality of the physical world and the needs of a resilient community. This requires a great effort to map the land and what is on it. We need to incorporate the future expected changes from climate change. And we need to investigate the supply of ground water and aquifer resources.

²⁶ Conradi, S. *Risk Assessment Maps and Data: Cortes Island Climate Action Planning*. Friends of Cortes Island, 2022.

The 2013 OCP frequently references the idea of “rural character”, even listing it first among the OCP’s principles (303, a, p. 13), although the term is not defined. This report understands “rural character” to imply a certain aesthetic appreciation for nature, combined with sparsely populated properties and relatively spread-out habitation.

However, such notions of “rural” are quite new on Cortes. The first permanent non-indigenous settlers did not arrive until the late eighteenth century. And even then, the lack of road infrastructure and vehicles tended to cluster people around safe harbours serviced by marine transport. Indeed, pre-contact settlement on Cortes and people living rurally around the world have always lived in small tribal villages. “Rural-character” therefore ought properly to be understood as a village aesthetic surrounded by agricultural activities and a thriving wilderness.

This report suggests that the OCP should shift its concerns from “rural character” to a focus on sustainability and Eco-social health. In doing so, it may be of use to encourage easing restrictions on the density of houses through rezoning the island. Importantly, this of course does not mean to allow unchecked development, but rather to encourage the controlled clustering of homes so as to ease the housing crisis, limit the habitat impacted by land clearing, increase sharing of resources including electric vehicles.

To this end, this report recommends the OCP supports rezoning to lands to Community land Stewardship plots to provide additional housing, lessening the housing crisis and to ensure that less land is cleared for road and gardens when new plots are opened. Amendments should generally be used to carefully allow for more density on properties, while simultaneously encouraging conservation covenants and stewardship practices. The “Ecovillage model” allows for such increases in density while clearing as little land as possible.

We further recommend the OCP include land-use zoning that makes allowances for people engaged in the climate and ecological emergency and community resilience. During world war 2, nations around the world made special accommodations for people engaged in the war effort. Farmers were given land, workers were given housing.

Land Use Recommendations

- *Shift principle of rural character to one of environmental sustainability and eco-social health.*
- *Support general relaxation of restrictions for building additional houses on properties, so long as it is in keeping with sustainable, environmental land use.*
- *Encourage more rezoning to community land stewardship plots.*
- *Support the creation and existence of “ecovillages”, which provide solutions to housing insecurity while limiting environmental impacts.*
- *Make accommodations for climate/ecological/resilience emergency workers*

Sea Level Rise Planning

Another central aspect of climate adaptation that any community planning initiative undertaken in coastal communities is sea level rise, and the resulting increased threat of storms surges, which

are predicted to increase in both frequency and intensity with climate change. Sea level rise planning is listed as an objective in the climate change section of the original OCP (404.1, 5, p. 22), which states the goal “To establish a coastal planning framework to respond to the impacts of climate change including sea level rise.”

Such a framework has not been developed, and planning for these impacts is of the utmost urgency, as serious climate change-induced droughts, storms and heat waves have already occurred. This report recommends this goal is reinstated, with more specificity, while also acknowledging and planning for the other climate impacts listed in this report.

Many policies recommended in the 2013 OCP were related to sea level rise and climate planning and should be reinstated and enhanced, however, little has been done on the following policies:

- i. The community, individual property owners, the Regional District and appropriate Federal and Provincial agencies shall take into consideration sea level rise and related climate influences on ocean water levels and how these will impact coastal ecosystems, sedimentation processes and flood risk to property;
- ii. The Regional District and appropriate Ministries shall take steps to identify Sea Level Rise Planning Areas that are at risk of sea level rise inundation or erosion;
- iii. The Regional District shall give consideration to land use bylaw amendments which will enhance the Island’s ability to respond or mitigate the impacts of climate change;
- iv. The Regional District shall refer to the BC Ministry of Environment “Guidelines for Management of Coastal Flood Hazard Land Use” for guidance in the consideration of applications for expansion of existing, or new land use developments;
- v. An Adaptive Risk Management Approach to sea level rise shall be given consideration; one which would plan how short-term land uses and structures can be occupied with reasonable risk for their lifespan, but also recognize and allow that future sea level rise may require the redesign to a higher elevation or relocation of the next generation of land uses and structures at a given coastal site;
- vi. All new coastal development proposals shall demonstrate consideration of the coastal floodplain and the potential for sea level rise; including the potential impact on coastal wells (salinization); and
- vii. In response to coastal systems and in protecting of coastal property, landowners are encouraged to utilize the “Greenhores Program” which incorporates planning and design elements that recognize ecological features and shoreline functions. (404.2, p.22)

Further emphasis, implementation and action is needed on all of the above policies, with items ii, iii, vii the most urgent and as of yet unaddressed issues. As for item V, Adaptive Risk Management is only truly possible when the risks are understood and while there is always an amount of uncertainty with climate change given massive unknowns such as carbon feedback loops, the baseline research on mapping sea level rise in this area has not as of yet been done, making planning for the slow retreat of structures difficult.

Working with groups such as the Greenhores Program, as per 2013 OCP, to use nature-based solutions to sea level rise and coastal restoration of shellfish, eel grass and kelp beds should be

encouraged. Amendments to the OCP should encourage the exploration of other adaptive strategies to sea level rise such as living-breakwaters, kelp reforestation and clam gardens, drawing on and implementing research conducted by the University of British Columbia's Coastal Adaptation Lab²⁷. Nature-based adaptations avoid ecological destruction caused by shoreline armoring and can be 35-70% cheaper to install and maintain²⁸, as well as providing co-benefits for local ecology and even food security.

This report recommends the OCP direct the SRD to create detailed sea level rise GIS maps, preferably for different scenarios of warming. Efforts to work with the SRD to acquire grant money for a Lidar survey of the area, in order to more accurately understand sea level rise, could also be revived and should be listed as a goal.

All shoreline projects and all housing should be planned through the lens of sea level rise adaptation, as well as planning for increased frequency and intensity of storms. To do so, the projections of 0.5m by 2050, 1m by 2100 and 2m by 2200 are advised, as is currently recommended by the provincial sea level rise primer²⁹. However, it should be noted that some studies based upon the relationship between atmospheric carbon levels and historic sea levels in the paleoclimatological record predict a possibly more rapid rise of 1.9m by 2100³⁰. Although 1m by 2100 is the standard federal prediction for sea level rise on the BC coast, it may be less given Cortes is in the process of isostatic rebound, meaning the land is still rising after glacial weight-loss. To what degree this will counteract sea level rise is debated, and as such this report recommends adopting the 1m by 2100 rise for planning purposes as a precautionary approach, until such a point as the community can collaborate with the SRD to create more localized sea level rise predictions and adaptation strategies. It is recommended that such a collaboration be supported by the OCP.

All shoreline developments and adaptations that risk disturbing archaeological sites must be done only by working with the Klahoose, Homolco and Tla'amin Nations, so as to be in alignment with Canadian Heritage Act, and so as not to destroy culturally, historically or spiritually significant places.

²⁷ "UBC Coastal Adaptation Lab – Linking Collaborative Research and Applied Knowledge to Community Action," UBC Coastal Adaptation Lab, accessed January 28, 2023, <https://blogs.ubc.ca/coastaladaptationlab/>.

²⁸ Eyzaguirre, J., et al. Green Shores 2020: Impact, Value and Lessons Learned, Final Project Report. Prepared by ESSA Technologies Ltd. Prepared for the Stewardship Centre for British Columbia. 2020. http://stewardshipcentrebc.ca/PDF_docs/greenshores/Resources/Green%20Shores%202020_%20Impact,%20Value%20and%20Lessons%20Learned_%20Full%20Report_July2020.pdf

²⁹ The Arlington Group Planning + Architecture Inc. EBA, a Tetra Tech Company DE Jardine Consulting Sustainability Solutions Group, "SEA LEVEL RISE ADAPTATION PRIMER a TOOLKIT to BUILD ADAPTIVE CAPACITY on CANADA'S SOUTH COASTS," 2013, <https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/resources/slr-primer.pdf>.

³⁰ IPCC. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Special Report of the Intergovernmental Panel on Climate Change. 2012. New York, USA: Cambridge University Press.

The OCP should recommend that any sea level rise adaptations, shoreline alterations and initiatives should be recorded with the Resilient C Coastal Community Hazard Network³¹, to build intercommunity networks and foster a culture of intercommunity resilience in the coastal region.

Sea Level Rise Recommendations

- *Develop coastal sea level rise planning framework.*
- *Reaffirm existing sea level rise planning goals, and plan for action specifically on items ii, iii and vii (OCP 2013, 404.2, p. 22).*
- *Work with the SRD to map sea level rise using GIS.*
- *Work with the SRD to revive efforts to map the area in detail using lidar technology.*
- *Work with organizations such as Greenshores and draw on research from the UBC Coastal Adaptation Research Lab to explore nature-based solutions to sea level rise, such as living breakwaters, kelp restoration and clam gardens.*
- *Consult and work with Klahoose, Homolco and Tla'amin on all adaptive measures that have the potential to interfere with archaeological sites.*
- *Log all shoreline alterations and adaptations with the Resilient C Coastal Community Hazard Network, to foster a culture of resiliency along the coast.*

Food Security

Agriculture

Given the pressure climate change will place on global and even regional supply lines, the rising cost of food makes food security a climate change adaptation issue. Food security was a principle of the 2013 OCP (303, k, 13). The policies supporting the local agricultural activities (403.2, p. 20) should be strengthened and reaffirmed. Particularly policy b: “Local food production and processing is supported through such mechanisms as: i. The development of a community garden ; and/or ii. The creation of a local food grower’s cooperative.” and f: “In addition to the traditional model of one farming family operating on each parcel, development of productive lands, outside the ALR, shall be facilitated through an Agricultural Land Stewardship designation and zoning which allows for shared ownership and multiple residences on larger parcels” (403.2, p. 21).

Further, given that food is critical, and land prices are high, this report recommends that the OCP call for the creation of a fund to be established to purchase agricultural land and be leased to farmers for very low rates. Agriculture is a very low-profit/high-community value endeavour and any land-costs can simply not be borne by the rates of return from selling food. We need to find ways to support our farmers.

³¹ “Resilient-C – Platform to Promote Coastal Risk Resilience,” resilient-c.ubc.ca (University of British Columbia), accessed January 28, 2023, <https://resilient-c.ubc.ca/>.

Aquaculture

The 2013 report acknowledges aquaculture as an important local industry (304.4, 2, p. 15). However, this report recommends that the OCP expands its language to acknowledge the potential and importance of aquaculture to Cortes as a low-carbon, environmentally sustainable source of local economic benefit, as well as its potential to greatly increase on-island food security.

Furthermore, amendments to the OCP should acknowledge the deep history of aquaculture in the region, through activities such as clam gardening by First Nations.

The aquaculture industry is a major employer on Cortes, however, due to the lack of a toxin testing site and processing facility, all commercially harvested shellfish must be shipped off island before consumption.

If consumed locally, shellfish represent one of the lowest polluting animal protein sources. 340 tonnes of GHG emissions are produced for one tonne of beef, compared to 11 tonnes per tonne of bivalve protein³². Additionally, bivalve production offers valuable ecosystem services such as ocean filtration.

This report recommends the OCP supports the work of local aquaculture operations and the Klahoose Nation, by consulting with them to see how best our community can continue to support the economic value of the aquaculture industry, while also making it a larger part of on-island food security. This would include promotion of shellfish as a regular part of a healthy island diet.

Furthermore, the OCP should express the value of protecting shellfish habitat and coastal waters as a means of keeping this valuable ecological and economic asset secure. This includes the emergency mitigation of climate pollution – current levels of ocean acidification and water temperature are already impacting shellfish farming. And future trajectories threaten the existence of this food, its cultural value, and this economic sector³³. As stated earlier in this document, failing to protect shellfish (by stopping climate change) constitutes a violation of the constitution.

This report also recommends that the OCP support working with the aquaculture industry and the Klahoose Nation, to explore the possibility of the return of a local bivalve shellfish processing and testing facility to Cortes.

Such an operation would enable the island to increase low-carbon food security, while also providing an additional source of income and employment. Further efforts should include supporting the creation of integrated multi-trophic seaweed-shellfish aquaculture operations, which studies show enhances the growth rate of kelp³⁴, while producing two marketable products

³² Willer and Aldridge 2020

³³ <https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-acidification>

³⁴ Matthew Simon Hargrave, *New Perspectives in Multi-Trophic Aquaculture*, *Gupea.ub.gu.se* (Gothenburg University, 2021), <https://gupea.ub.gu.se/handle/2077/67612>.

simultaneously, as well as restoring surrounding marine habitat in some cases³⁵. Further initiatives could identify areas in which to support the wild harvest of clams, pacific oysters and sea urchins, as a means of providing economic benefit while reducing pressure on Indigenous bivalves and kelp beds (in the cases of pacific oysters and sea urchins).

Shellfish aquaculture is currently under threat in some places due to local fecal contamination. This report recommends that significant resources be devoted to solving the conflict between liveboard boaters in gorge harbour and shellfish aquaculture.

Food Security Recommendations

- ***Amend OCP language to understand increasing risk of food security with climate change.***
- ***Support agriculture policies from 2013 OCP, and take action on items yet unaddressed.***
- ***Acknowledge the importance of aquaculture as a low-carbon, economic and ecological adaptation.***
- ***Support Klahoose First Nation and local aquaculture operations.***
- ***Reiterate importance of protecting ecological integrity of coastal waters.***
- ***Support and encourage the return of a local shellfish processing and toxin testing facility.***
- ***Encourage and support efforts at seaweed farming and integrated multitrophic aquaculture operations.***
- ***Encourage new, and amplify existing, efforts to sustainably wild harvest shellfish, particularly in areas where pacific oysters and sea urchins exert extreme pressure on Indigenous species habitat.***

Managing Forest and Wetland Natural Cycles

There are a multitude of exciting and innovative technologies and approaches coming out of the burgeoning field of climate adaptation. Some of our best and most critical island assets are the natural systems and cycles that keep Cortes' ecosystem functioning. These natural systems are our first line of defence against the changing climate, and it is critical that they are recognized and understood so that they may be protected, as well as actively engaged with in order to assist with adaptation. Healthy forests sequester and store carbon, as well as enable water retention during drought, assisting in both climate mitigation and adaptation.

The 2013 OCP expresses the communities' commitment to conservation and the preservation in sections 414.1 and 414.2. Of these, the establishment of the Cortes Community Forest Cooperative (CCFC), community forest, and Cortes Forestry General Partnership (CFGP) has been a great accomplishment (objective 414.1, c, p. 47). The importance of the community forest

³⁵ Seth J. Theuerkauf et al., "Habitat Value of Bivalve Shellfish and Seaweed Aquaculture for Fish and Invertebrates: Pathways, Synthesis and next Steps," *Reviews in Aquaculture* 14, no. 1 (June 25, 2021), <https://doi.org/10.1111/raq.12584>.

and CFGP to climate mitigation and adaptation should be acknowledged in revisions to the OCP, so that they might be better supported through community planning. The inclusion of encouraging and or incentivising Ecosystem-based management plans for forestry (414.2, b, p.48) should be reiterated and strengthened. In alignment with these goals and the principles of community governance, the OCP should encourage efforts to work with CFGP, as well as local NGOs such as the Cortes Community Foundation to support the purchase of forestry lands held by private forestry firms, in order to ensure as best as possible that management decisions regarding the watershed and its resources are made by the island community.

This report also recommends general efforts to encourage and incentivize conservation covenants. Tax relief should be considered for property owners making significant contributions to protecting our shared ecological services and assets.

Another crucial ecological asset in the process of climate adaptation are the ecosystem services provided by the island's wetlands. Wetlands store carbon and increase water retention³⁶, mitigating droughts and lowering the risk of wildfires. In these ways, wetlands assist in both climate mitigation and adaptation.

This report recommends the OCP include further language to acknowledge the importance of protecting wetlands to climate adaptation mitigation, alignment with OCP section 406.1, sensitive ecosystem protection (p. 25), as well as exploring possibilities with groups such as FOCI and the Cortes Community Foundation for grants to support wetland restoration on private lands and identifying areas of where restored wetlands could act as fire guards. It is also recommended that the OCP support efforts to educate islanders on the importance of wetlands to both ecosystem and social health. Such education should include information on the important role of beavers as wetland ecosystem engineers; slowing water flow to create and maintain wetland habitat. Education efforts would be aimed at increasing awareness of the importance of cohabitating peacefully with beavers.

Recommendations for Forest and Wetland Natural Cycles

- ***Acknowledge the importance of wetland and forest ecosystems in climate mitigation and adaptation.***
- ***Support the Community Forest Partnership in its mandate and mission.***
- ***Support working with the Cortes Forestry General Partnership and local NGOs to transfer forestry land tenures to be managed by community groups.***
- ***Encourage and incentivise the creation of conservation covenants for areas that provide ecosystem services.***
- ***State the importance of wetland and riparian areas to carbon sequestration and storage, as well as climate adaptation.***

³⁶ P.-A. Jacinthe, R. Lal, and J. M. Kimble, "ORGANIC CARBON STORAGE and DYNAMICS in CROPLANDS and TERRESTRIAL DEPOSITS as INFLUENCED by SUBSURFACE TILE DRAINAGE," *Soil Science* 166, no. 5 (May 2001): 322–35, <https://doi.org/10.1097/00010694-200105000-00003>.

- *Support identifying areas for wetland restoration, prioritizing areas that overlap with those identified as at high-risk of wildfire.*
- *Encourage and incentivise the restoration of wetlands through public education, grants and the possible establishment of a climate adaptation fund.*

Natural Assets

This report recommends that the OCP identify ecological assets that play crucial roles in natural cycles such as ocean filtration, carbon sequestration and storage and ecosystem water retention. These assets should be identified, mapped and plans for how best to manage them created. Natural assets could be potential beneficiaries of the rights of nature.

Such assets should include Cortes' known salmon streams. Efforts at climate adaptation must account for the importance of salmon, as both a cultural and ecological keystone species. Salmon returns have been fairly steadily declining³⁷. Therefore, this report recommends the following salmon spawning watersheds be listed as natural assets to be protected: James Creek, Basil Creek, Whaletown Creek, Hansen Creek, Mansons Lagoon Creek.

This report also recommends the OCP work with the FOCI Streamkeepers and the Klahoose First Nation to protect salmon spawning habitat, as well as juvenile salmon habitat such as eelgrass. Working with the SRD and provincial government for hydrological survey and assessment of Basil Creek.

Old growth provides critical ecosystem services in sequestering and storing carbon, with replanted forests taking as long as 250 years to store the equivalent carbon released in cutting down old growth³⁸. As such, what old growth remains should be classified as a natural asset. This report recommends the OCP support working with the Mother Tree Mapping project on Cortes to identify old growth stands and “mother trees”, and then prioritize their protection.

This report recommends the OCP support working with FOCI to identify areas of eelgrass habitat, which both play roles in carbon sequestration. These areas should be understood as marine assets. Furthermore, the OCP should encourage work with FOCI and the Klahoose First Nation to identify areas for kelp restoration.

This report recommends additional mapping function as part of OCP renewal and revitalization. Natural assets need to be identified on a map to effectively make land use decisions.

Natural Asset Recommendations

Recognize salmon spawning streams, wetlands, old growth stands, eelgrass beds and kelp forests as natural assets for the purpose of climate mitigation and adaptation.

³⁷ Stream keeper Christine Robinson, personal communication.

³⁸ Harmon ME, F. W. Effects on carbon storage of conversion of old-growth forests to young forests. 1990. Science, 699 – 702.

- *Identify specific areas, such as James Creek, Basil Creek, Whaletown Creek, Hansen Creek, Mansons Lagoon Creek.*
- *Support work with the mother tree mapping project to identify remaining old growth on Cortes.*
- *Support working with FOCI to identify eelgrass beds.*
- *Encourage efforts to identify areas for kelp restoration.*

References:

Amy Lubik, Angela Wheeler, Brande Strachan, Brooks Hogya, Christine Grist, Emily Newhouse, Emily Peterson, Gerrit van der Leer, Haley Miller Office, Heather, Helena Swinkels, Jamie Galt Ministry, Jeanette Campbell, John Lavery, Ken Craig, Leigh Greenius, Magdalena Szpala, Martin Lavoie, Michael Schwandt, Paula Tait, Raina Fumerton, Sarah Henderson, Scott Blessin, Shannon and Silvina Mema. “BC Provincial Heat Alert and Response System (BC HARS): 2022,” www.bccdc.ca, 2022, <http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/Provincial-Heat-Alerting-Response-System.pdf>.

Berman-Hatch, Forrest. “Carbon Footprint of Travel to Cortes.” Friends of Cortes Island. 2022.

Boyd, David R. *The Rights of Nature : A Legal Revolution That Could Save the World*. Toronto: Ecw Press, 2017.

Buls, Bruce. “New Hybrid-Electric Ferries Provide Bridge to Zero Emissions.” www.workboat.com, 2022.

<https://www.workboat.com/shipbuilding/new-hybrid-electric-ferries-provide-bridge-to-zero-emissions>.

Bylaw No. 139, being Cortes Island Official Community Plan Bylaw. Strathcona Regional District. 2013.

Conradi, S. *Risk Assessment Maps and Data: Cortes Island Climate Action Planning*. 2022. Friends of Cortes Island.

Cortes Carbon Solutions. "CORTES CLIMATE ACTION INITIATIVE," 2010. District of Logan Lake. "FireSmart Program : District of Logan Lake." loganlake.ca. Accessed January 28, 2023. <https://loganlake.ca/your-municipality/firesmart-program/>.

Elliot, Jim. "B.C. Inventor Creates Rooftop Sprinklers to Protect from Wildfires - Vancouver Island Free Daily." www.vancouverislandfreedaily.com, April 26, 2019. <https://www.vancouverislandfreedaily.com/business/b-c-inventor-creates-rooftop-sprinklers-to-protect-from-wildfires/>.

Eyzaguirre, J., Boyd, R., Prescott, S., Morton, C., Nelitz, M. and Litt, A. *Green Shores 2020: Impact, Value and Lessons Learned, Final Project Report*. Prepared by ESSA Technologies Ltd. Prepared for the Stewardship Centre for British Columbia. 2020.

http://stewardshipcentrebc.ca/PDF_docs/greenshores/Resources/Green%20Shores%202020_%20Impact,%20Value%20and%20Lessons%20Learned_%20Full%20Report_July2020.pdf

Government of Canada. "Net-Zero Emissions by 2050." Government of Canada, November 19, 2020.

<https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html>.

———. "Surviving the Heat: The Impacts of the 2021 Western Heat Dome in Canada." Science.gc.ca. Government of Canada, 2022.

<https://science.gc.ca/site/science/en/blogs/science-health/surviving-heat-impacts-2021-western-heat-dome-canada>.

Hargrave, Matthew Simon. *New Perspectives in Multi-Trophic Aquaculture*. Gupea.ub.gu.se. Gothenburg University, 2021. <https://gupea.ub.gu.se/handle/2077/67612>.

www.bcferries.com. "Island Class Ferries 2022 | BC Ferries," 2022.

<https://www.bcferries.com/in-the-community/projects/island-class-ferries>.

Harmon ME, F. W. (1990). Effects on carbon storage of conversion of old-growth forests to young forests. *Science*, 699 – 702.

IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-33, doi:10.1017/9781009325844.001.

IPCC. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Special Report of the Intergovernmental Panel on Climate Change. 2012. New York, USA: Cambridge University Press.

Jacinthe, P.-A., R. Lal, and J. M. Kimble. “ORGANIC CARBON STORAGE and DYNAMICS in CROPLANDS and TERRESTRIAL DEPOSITS as INFLUENCED by SUBSURFACE TILE DRAINAGE.” *Soil Science* 166, no. 5 (May 2001): 322–35.
<https://doi.org/10.1097/00010694-200105000-00003>.

Osoba, Greg. “BC Ferries Calls on Shipyards to Bid on Construction of Four New Vessels | Cortes Radio.” *cortesradio.ca*, 2022.
<https://cortesradio.ca/bc-ferries-calls-on-shipyards-to-bid-on-construction-of-four-new-vessels/>.

resilient-c.ubc.ca. “Resilient-C – Platform to Promote Coastal Risk Resilience.” University of British Columbia. Accessed January 28, 2023. <https://resilient-c.ubc.ca/>.

Province of British Columbia (2019). BC Climate Risk Assessment Summary. www2.gov.bc.ca/assets/gov/environment/climatechange/adaptation/climate-risk-summary.pdf; 2019. <https://www.canada.ca/en/health-canada/services/climate-change-health/extreme-heat.html>

The Arlington Group Planning + Architecture Inc. EBA, a Tetra Tech Company DE Jardine Consulting Sustainability Solutions Group. “SEA LEVEL RISE ADAPTATION PRIMER a TOOLKIT to BUILD ADAPTIVE CAPACITY on CANADA’S SOUTH COASTS,” 2013.
<https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/resources/slr-primer.pdf>.

Theuerkauf, Seth J., Luke T. Barrett, Heidi K. Alleway, Barry A. Costa-Pierce, Adam St. Gelais, and Robert C. Jones. “Habitat Value of Bivalve Shellfish and Seaweed Aquaculture for Fish and Invertebrates: Pathways, Synthesis and next Steps.” *Reviews in Aquaculture* 14, no. 1 (June 25, 2021). <https://doi.org/10.1111/raq.12584>.

Transition Saltspring Society. “Saltspring Climate Action Plan.” Transition Saltspring Society, 2022.
<https://transitionsaltspring.com/wp-content/uploads/2021/01/1.-CAP-2.0-COMplete-Web.pdf>.

UBC Coastal Adaptation Lab. “UBC Coastal Adaptation Lab – Linking Collaborative Research and Applied Knowledge to Community Action.” Accessed January 28, 2023.
<https://blogs.ubc.ca/coastaladaptationlab/>.

Waite, Richard & Beveridge, Malcolm & Brummet, R & Castine, Sarah & Chaiyawannakarn, Nuttapon & Kaushik, Sadasivam & Munkung, R & Nawapakpilai, S & Phillips, Michael. (2014). Improving Productivity and Environmental Performance of Aquaculture.

Zemenak, Debrah. “Strathcona Regional District Electoral Area B: Cortes Island Community Wildfire Protection Plan 2020 Update,” 2021.