May 18, 2018

To whom it may concern,

Following the extraordinary 2017 freshet and wildfire season, traditional sources of food were affected in many parts of BC, and the timelines for re-establishment of these food sources are uncertain. As requested by a number of communities, the Province has developed a package designed to provide basic information about a number of long-term food initiatives that communities can undertake to independently and locally address food security concerns. The long-term food information package is intended to support educated alternative approaches to long-term food security and to introduce options outside of the normal scope of food sources.

The information package provides general descriptions of each food production option, lists of considerations for each initiative, references and links to legal requirements, resources for expertise/consultations, sources for specialized materials or equipment, and potential funding sources. The initiatives are all scalable to accommodate individuals or families, and a range of community sizes. The implementation of any of the food programs is at the discretion of the community, and it is the community’s responsibility to acquire its own funding sources. Additionally, some of these initiatives require permits, insurance, licenses, certifications, geographical demands or other, and may not be achievable in all locations. Please explore every option thoroughly before implementation. The package consists of four initiatives:

1. Greenhouses and alternate structures as well as planting options, including:
   a. community gardens;
   b. container gardening (microgreens); and
   c. native plants for traditional foods and medicinal use.
2. Aquaponics
3. Fish hatcheries
4. Poultry farming

Information regarding Plant-based Nutrition is being developed in collaboration between Health Authorities and is not yet available. However, some current online resources are linked for your reference.

We hope that you will find the attached information packages useful. Please let us know if you have any comments or concerns so that we may address them in future versions, as this document will be edited and updated to reflect new information as it becomes available.

The Provincial Disaster Recovery team
Long-Term Food Security Initiatives

Information Packages

5/18/2018
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Long-Term Food Security Initiatives
Updated: May 18, 2018
Aquaponics

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Background

It is widely recognized that the 2017 freshet flooding and wildfires significantly impacted the province of British Columbia (BC). With approximately 1.2 million hectares destroyed by wildfires alone, the impact on the traditional territories of 25 First Nations communities resulted in loss of winter food supplies as well as the potential for seasonal food gathering, fishing, and hunting. As communities started to look at recovery from these natural disasters, immediate needs were addressed by organizations commonly mobilized in emergencies. Emergency Social Services (ESS), the Salvation Army (TSA), the Canadian Red Cross (CRC), and other non-governmental agencies provided a variety of programs for immediate and short-term support.

As winter approached, mid-term recovery needs began to emerge; specifically, the need for winter food supplies, heating fuel sources, and feed for non-farm status animals. Provisional programs were established for these needs.

In November 2017, the First Nations Health Authority (FNHA) identified long-term food security as a significant mental health stressor that was prevalent throughout the province. A number of First Nation’s communities had ideas to address this concern and requested Provincial assistance both to initiate and to share these ideas to promote province-wide self-sustainability and resilience. These information packages are the result of that request.

Purpose

As the floods and fires affected traditional food sources, and the timelines for re-establishment of these resources is uncertain, the goals of the information packages are to support educated alternative approaches to long-term food security and to stimulate thinking of options outside of the normal scope of food sources. These approaches to long-term food security may be adopted by any individual or community to support their future self-sufficiency and resilience.

Scope

The long-term food security initiatives information packages provide general descriptions of each food production option, lists of considerations for each initiative, references to legal requirements, and potential funding sources for implementation of each initiative. The initiatives are all scalable, so can be suitable for small, medium, or large communities. The implementation of any of the food programs is at the discretion of the community. It is the individual community’s responsibility to acquire its own funding sources. The packages are designed to give the basic information a community needs to determine if any of the long-term food security initiatives are right for their community. The information is in no way absolutely complete. Each main idea may trigger more questions. Alternate ways to develop each idea are presented according to the required or desired scale. Communities can pick and choose those that seem to apply to their own situation.
Audience
The primary audience for this document is any individual who, or community which, was directly impacted by the freshet flooding and wildfire events in 2017. The information packages were distributed electronically, on a USB, and, where requested, in hard copy to community Recovery Managers, Band Administrators, local planning authorities and recognized/identified food security groups, and the Community Wildfire Recovery Branch (Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD). This document was also widely shared by email, and will also be posted on the 2017 Flood and Wildfire Recovery Programs webpage: https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/emergency-response-and-recovery/recovery-programs

Overview
The purpose of these information packages is to provide basic background information about a number of long-term food initiatives which communities can undertake to independently and locally address food security concerns.

There are four long-term food security initiatives presented:

1. Greenhouses and Alternate Structures. Planting options include:
   a. community gardens;
   b. container gardening (microgreens); and
   c. native plants for traditional foods and medicinal use.

2. Aquaponics
3. Poultry Farming
4. Fish Hatcheries

An additional area of interest was plant-based nutrition education. The request for development of a plant-based nutrition education program was forwarded to the Health Authorities as this requires medical expertise.

For the fish hatchery initiative, it is recognized by the fisheries industry that a joint effort of either a number of communities within a Nation, or the joint efforts of Nations with adjacent territories would be most efficient and practical as the majority of the impacted communities are along the Fraser River watershed. This specifically refers to fish that are released. Lake-based initiatives may be developed by individual communities or joint efforts of communities based around a common lake.

Environmental stewardship is inherent in each of the initiatives. Local food production will eliminate the “food miles”, decreasing a community’s carbon footprint and the environmental impact from transportation of food supplies.

The suggested initiatives range between short-term, medium-term or long-term timelines. Each initiative can provide sustainable, self-sufficient food production for individuals or communities depending on the scale of implementation. Should a community choose to do so, the projects can provide opportunities for education, training, employment, trade, or commercial business.
Preface
Some of the long-term food security initiatives being presented in these packages were suggested by a number of First Nations communities in British Columbia. The individuals who contacted the Province were interested in information sharing to support all communities to recover from the freshet flooding events and wildfires of 2017.

You will find commonalities in that each initiative provides the opportunity for communities to produce locally grown, fresh, and healthy foods.

Individuals or families can implement these ideas to feed themselves or the whole community can share food. In addition, trade or sharing of food can occur. If your level of food production expands, or you choose to target viable markets, specialized sales can be pursued with businesses such as hotels and restaurants.

With each of these initiatives, there is the opportunity to involve children and youth from start to finish – planning, set-up, planting, plant maintenance, feeding animals, harvesting, and of course, enjoying meals made from things that they helped to produce.

These initiatives can provide educational opportunities about horticulture, food production, environmental care, and cycles of nature.

Employment can be created depending on the size and scope of your initiative.

A key benefit to all of these long-term food initiatives is that it creates an opportunity for elders to work with youth in passing on their traditional regional knowledge of both edible and medicinal plants. We hope that you will find each of these suggested initiatives useful to ensure your long-term food security.

Disclaimer
The implementation of any food security initiatives is at the discretion of the community. It is the individual community’s responsibility to acquire its own funding sources.

Please note that some of the food security initiatives require permits, insurance, licenses, certifications, geographical demands or other, and may not be achievable in all locations. You are encouraged to explore every option thoroughly before implementation.

The information in the package is provided as a public service by the Government of British Columbia. All of the information the package contains is provided "as is" without warranty of any kind, whether express or implied. Links and references to any other websites and resources are provided for information only and listing them shall not be taken as endorsement of any kind. The Government of British Columbia is not responsible for the content or reliability of the linked websites and resources and does not endorse the content, products, services or views expressed within them.
Limitation of Liabilities
Under no circumstances will the Government of British Columbia be liable to any person or business entity for any direct, indirect, special, incidental, consequential, or other damages based on any use of this information or any other information linked within this package, including, without limitation, any lost profits, business interruption, or loss of programs or information, even if the Government of British Columbia has been specifically advised of the possibility of such damages.

Contents
Each of the packages contains

- a description of the initiative
- a timeline from what needs to be done to set things up for harvesting
- materials required
- labour requirements
- potential benefits/growth
- cost considerations
- material or information resources
- legal considerations, if they apply
- potential funding resources

Information regarding grant writer funding, a grant writer’s resource list, and how to become a registered charity is provided in the section General Grant Information.

Acknowledgements
We are grateful for the contributions of students in the development of these long-term food security initiatives. We would like to acknowledge:

- Humber College, Toronto, Ontario,
  Project Design and Planning – International Development Graduate Certificate Program
- University of Victoria, Victoria, British Columbia,
  Geography Co-operative Program
Considerations for All Long-Term Food Security Initiatives

The following section includes some considerations that may support the success of any initiative.

Assessment

- Determine if there is a real need and desire for the identified initiative. If the initiative is not widely supported within your community, it will most likely fall to the one person or small group that is enthusiastic about it. Dependency on a single person or small groups may affect the long-term success of any project.
- Clearly define what the initiative will cover. It is most effective if you narrow the focus so that efforts can be targeted and concentrated to bring about success.
- Decide on your target population – who is this initiative for? -- kids, seniors, special populations, or the whole community.
- If the project is meant to benefit a particular group, it is essential that representatives of that group be involved in all phases of the planning including on the planning committee.

Governance and Starting an Organizing Committee or Board

- First Meeting -- Organize a meeting of interested people. Identify some potential initiative leaders in advance and ensure that you have approached the person or persons ahead of time about possibly taking a leadership role. Some people need time to consider this role and are more likely to agree if they are mentally prepared rather than taken by surprise by spontaneously being asked at the meeting.

It is helpful to have some goals for this meeting, such as deciding how formal or structured you want this to be. For example, if the group decides that it would like to form a Garden Committee, the bigger group can identify potential people to be the committee chair and executive (co-chair in case of the chair's absence, treasurer, secretary to take notes), how many people will be on the committee, and some sub-committees. Note that sub-committee chairs or leads are usually from the actual planning committee, and that people to help on the sub-committees can be from the general public. Sub-committees do not have to be on-going. They can be created as needs arise, and dissolved once the need is taken care of.
  - Examples of sub-committees: Funding & Resource Development; Youth Activities; Construction; Governance

- Many committees are organized very informally and operate successfully. Leaders "rise to the occasion" to propose ideas and carry out tasks. However, as the work load expands, many groups choose a more formal structure for their organization.
A structured program is a conscious, planned effort to create a system so that each person can participate fully and the group can perform effectively. It's vital that the leadership be responsive to the members. Structure will help an organization to last; it will promote trust; it will help your group grow and create new opportunities for leaders to develop.

Ongoing Meetings
- In the beginning, it is best to have regularly scheduled meetings to help to keep yourself on track. It is easier to cancel meetings because they are not required at the time than it is to schedule meetings with groups of people.
- If your group is new, have several planning meetings to discuss your program and organization. Try out suggestions raised at these meetings and, after a few months of operation, you'll be in a better position to develop by-laws or guidelines. A project should be kept simple and focused on one goal, whether large or small.
- By-laws are rules which govern the internal affairs of an organization. They are required when you form a non-profit corporation, but are useful even if your group is a club or a group of neighbours. It's helpful to look over by-laws from other similar organizations if you decide to incorporate. Guidelines and rules are less formal than by-laws, and are often adequate enough for a group that has no intention of incorporating.

Organizational Considerations
- What is your purpose? What are your short, medium, and long-term objectives?
- How are decisions to be made? Who chooses leaders and how?
- How will work be shared? Who does what?
- For what things do you need to have money? How will you raise money -- membership dues, fundraising, grants, sponsors?
- Flexibility is important when goals and members change.
- Do you want to be incorporated or act as a club?
- Decide if your group wants to seek a sponsor. A sponsor is an individual or organization that supports an initiative. Sponsorship can be a tremendous asset. Sponsors are often related to the initiative and sometimes provide supplies and equipment if they are able to do so. However, sometimes sponsors are totally unrelated. Sponsors may provide some financial support, volunteer hours, or may just provide their reputation as evidence that your initiative is genuine and reasonable.
- Make a list of what needs to be done.
- Develop a proposed timeline.

Insurance
It is becoming increasingly necessary for groups to consider public liability insurance. Suggestion: Consider working with an agent from a firm which deals with many
different carriers (so you can get the best policy for your needs). You may have better success with a larger insurance carrier, rather than a smaller one.

**What Goes into Formal By-laws**

**If You Become a Registered Charity or Incorporation**

- Full official name of organization and legal address.
- The purpose, goals and philosophy of the organization.
- Membership categories and eligibility requirements.
- Membership dues, how much and when paid.
- Specify when and how often regular or special meetings of the membership are to be held, as well as regular and annual meetings of the board of directors. Formal minutes must be recorded for each meeting.
- State what officers are necessary, how they are chosen, length of term, their duties (job description), and how vacancies are filled.
- State special committees, their purpose and how they operate.
- Establish a system so that by-laws can be rescinded or amended, maybe by a simple majority. Separate by-laws from policies. Policies can be changed at any time by a board discussion and vote. By-law changes must be presented in advance to general membership, and then voted on at the Annual General Meeting.
- State any official policies or practices: e.g. the garden group will avoid the use of hazardous substances
- If your activity involves working with children or vulnerable people, consider if you want it to be a requirement of board members or employees and volunteers to have a clear criminal record check.
- Include a Hold Harmless clause (sample):
  "We the undersigned members of the (name) garden group hereby agree to hold harmless (name owner) from and against any damage, loss, liability, claim, demand, suit, cost and expense directly or indirectly resulting from, arising out of or in connection with the use of the (project name), its successors, assigns, employees, agents and invites."

**Scale**

Scale can refer to the amount of space that you are taking up, the amount of food that you produce, the cost of the initiative, or the number of individuals that your initiative will feed. In choosing the scale of your project, consider how many people and how much time will be required to initiate the project, as well as the cost. It may be better to start as a “pilot” project to figure out how to do things properly and to only feed a few people, rather than trying to do something too big that aims to feed everyone, that may be too complicated and difficult, and will be too difficult to achieve on first attempt. Once you have it figured out, then you could expand.
Location

Regardless of the project that you are initiating, location is always an important consideration. Location may be determined by:

- The size of the project and if this is stage one as a pilot project. If you want to start small and plan to later expand, it is better to have set aside a larger location rather than having to move with each expansion.
- If the project requires sunlight, the direction of sunlight, or the amount of sunlight
- Access to utilities – water and hydro if required
- Proximity to local rivers and the level of flood risk
For information on river forecast data see link below:
http://bcrfc.env.gov.bc.ca/freshet/ALL_WSC_GoogleMap.html
- Additional required space for items such as compost, extra soil, feed
- Requirement of lockable storage for tools and equipment
- Storage which is secure from animals (e.g. feed) or from children (e.g. fertilizers or other potentially hazardous substances)
- If there are concerns regarding access by animals, predators, pests, or human intruders
- Waste management considerations
- The size of your community and participants’ needs – do you need wheelchair or walker accessibility?
- Determine if you need parking spaces, and allow room for delivery vehicles or space for work parties to be able to complete certain tasks
General Grant Information

Opportunity for Grant Writer Funding
Northern Development Initiative Trust (NDIT) Grant writing support
- NDIT provides $432,000 in annual funding to support 54 grant writing positions across central and northern B.C. each year.
- First Nations and Municipalities/Regional Districts are eligible to apply
- Maximum grant % available: 76%
- Maximum grant $ available: $8,000
- Intake Frequency: Annually (November to January)
- Applications accepted starting November 1st, but must be received by midnight January 31st
- For more details see the link below
  https://www.northerndevelopment.bc.ca/funding-programs/capacity-building/grant-writing-support/

Application Guide

Application Form
Grant Applications Assistance
NOTE: These individuals are not affiliated with the Province of BC. They are members of The Firelight Group http://www.thefirelightgroup.com/ who have independently offered their services to support First Nations communities only with application processes for grants to assist with recovery initiatives. Negotiation of fees for service is the responsibility of the communities and the individual grant writer.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelsey Taylor</td>
<td><a href="mailto:kelseyleightaylor@gmail.com">kelseyleightaylor@gmail.com</a></td>
<td>(604)655-6681</td>
</tr>
<tr>
<td>Meagan Tiswell</td>
<td><a href="mailto:mtwiss6@gmail.com">mtwiss6@gmail.com</a></td>
<td>(604) 725-7137</td>
</tr>
<tr>
<td>Gillian Nicol</td>
<td><a href="mailto:gnicol7@hotmail.com">gnicol7@hotmail.com</a></td>
<td>(250) 726-5164</td>
</tr>
<tr>
<td>Lara Boulos</td>
<td><a href="mailto:laratboulos@gmail.com">laratboulos@gmail.com</a></td>
<td>(778) 839-6975</td>
</tr>
<tr>
<td>Mania Nematifar</td>
<td><a href="mailto:nematifar.mania@gmail.com">nematifar.mania@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td>Janet Knight</td>
<td><a href="mailto:janetkivettknight@gmail.com">janetkivettknight@gmail.com</a></td>
<td>(807) 355 9587</td>
</tr>
<tr>
<td>Iain Mjbanks</td>
<td><a href="mailto:iain.mjbanks@gmail.com">iain.mjbanks@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td>Shauna Johnson</td>
<td><a href="mailto:shauna.johnson31@gmail.com">shauna.johnson31@gmail.com</a></td>
<td></td>
</tr>
</tbody>
</table>

Charity Status
Many of the grant opportunities listed below are designed for organizations holding registered charity status with the Canada Revenue Agency (CRA). The option exists to apply for registered charity status, or to partner with organizations that already hold registered charity status with the CRA.

How to apply for charity status:

Search registered charities in Canada:

Note: Grants that may be applicable for each initiative are listed at the end of each initiative information package.
Greenhouses and Alternate Structures

About Greenhouses and Alternate Structures

Greenhouses and alternate structures for growing fresh fruits and vegetables offer a variety of advantages. Not only can these structures increase your crop yield by protecting plants from uncontrolled elements, but they can also provide protection from various plant-eating animals including deer and rabbits. A more centrally based location allows for safer and easier access to the food supply, and year round crops are possible if a heating source is established. A variety of growing options are possible within a greenhouse or alternate structure. Some of these options are presented within the informational packages including container gardening/microgreens, native edible and medicinal plants, aquaponics, and community gardens. Combined gardening within your own community, decreased transportation of food, and composting garden waste all contribute to a decreased carbon footprint which is also good for your community and the environment.

Main Reason for Gardening

- Addressing Physical and Mental Stress: 18%
- Community Building: 11%
- Satisfying Curiosity and Building Skills: 20%
- Enhanced Meals and Diet: 14%
- Environmental Concerns related to Food: 8%
- Involvement of Children: 5%
- Saving Money on Food: 4%
- Preserving Tradition and Culture: 11%

Source: "Not Just a Passing Fancy: How Community Gardens Contribute to Healthy and Inclusive Neighbourhoods" 2018
Benefits of Greenhouses and Alternate Structures

Health Benefits
- Locally grown food creates transparency in terms of knowing what, if any, pesticides/genetic modification/chemicals are involved with the production of your food.
- Access to year round seasonal fruit, vegetables, herbs and medicinal plants.

Education and Employment Opportunities
- To train interested community members including all ages and genders.
- To have fieldtrips/student volunteers. Educate youth on practical skills including the importance of plant-based nutrition, growing seasons, gardening techniques, and composting techniques. Ensures students have access to fruits and vegetables once harvestable.
- To employ community members for day-to-day operations, especially if the project expands to a large-scale operation.
- See Resources for more information on Tsawwassen Farm School.

Opportunity for Growth
- To adapt gardening practices to suit a single community, or multiple communities year round.
- To increase the opportunity to trade, sell, or share products between multiple communities.
- To provide fruits, vegetables, and herbs to restaurants seeking local/regionally traditional foods.

Environmental Benefits
- Reduces the ‘Food Miles’ or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.
- No risk of harmful fertilizer runoff into local watersheds as in traditional land-based farming practices.

Increasing Food Security
- Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.
- Due to the ability to artificially create a stable environment, the community could be able to adapt to environmental changes such as natural disasters and climate change.
- If container gardens/aquaponics systems are raised off the ground, they are less likely to be damaged during harsh weather events than traditional land-based farming techniques.
- Opportunity to grow year round.
Traditional Indigenous Knowledge Sharing Opportunity
- Opportunity for elders to pass down traditional horticultural knowledge to youth regarding regional native edible plants growing/harvesting seasons as well as medicinal plant knowledge.

Governance Structure
See Considerations for All Long-Term Food Security Initiatives
Greenhouses Styles

Examples

Source: https://www.flickr.com/photos/usdagov/7461810600


Source: https://commons.wikimedia.org/wiki/File:Greenhouses_for_Grapes.jpg
Assessing Needs and Determining Goals

Consultations or Training
- How is your community going to obtain education/training?
  - Option to book consultations with experts or to do independent research online to decide on a system that suits your community’s needs
  - See Resources for information on the Tsawwassen Farm School for a potential training opportunity

Governance Structure
- See Considerations for All Long-Term Food Security Initiatives

Scale Considerations
- Scale Options
  - Small: Feeds individual families
  - Medium: Feeds community
  - Large: Commercial (for distribution)
- Assess the number of people that need to be fed
  - Project can be designed to support individual families, communities, local restaurants, or commercial sale
  - Recommend starting small to feed individual families/communities and to expand from there if the project is successful
- Does your community want to work with other communities?
  - Communities working together can decide to grow one crop (mono-cropping) and exchange and/or sell produce with another community that is focusing on something different. This allows growers to focus on producing one thing as best as they can, while receiving a diversity of products from surrounding communities
- Production goals:
  - Year round or seasonal?
  - What are your harvesting goals?
- Determine whether you want to purchase a kit and book consultations through experts in your region, or take on a do-it-yourself (DIY) approach

**Assess Location**

- Considerations for building on the foundation of the existing landscape should include:
  - The square footage to which you have access
  - The regional/seasonal climate
  - Access to water (city, well, natural stream or river)
  - If location is near a water source, how to ensure no fertilizers or pesticides will contaminate source
    - Determine what the drainage is like in proposed area
  - If near a river determine the level of flood risk
    For information on river forecast data see link below: [http://bcrfc.env.gov.bc.ca/freshet/ALL_WSC_GoogleMap.html](http://bcrfc.env.gov.bc.ca/freshet/ALL_WSC_GoogleMap.html)
  - Availability of labour
  - Access, direction, angle, and duration of sunlight
    - Sunlight trends for each season
    - Morning sun locations are better for plant growth than afternoon sun locations
    - Ensure there are no shadows from trees, bushes, houses, and other structures in the morning hours
    - Areas with deciduous trees are preferred over areas with coniferous trees since deciduous trees drop their leaves in winter, therefore allowing more sunlight to reach the greenhouse
  - Access to power
    - If implementing a lean-to structure, power can be shared from the existing building to which the lean-to is attached
    - If implementing a different style of greenhouse/structure, hire a certified electrician if required
  - Access to storage (cold, dry)
  - Access to distribution (refrigerated trucking, regular vehicles)
  - Is the land cleared/level/accessible? What preparation is required for set up?
    - If land is not level you may need to encourage drainage by filling the area
    - Consultation may be required to ensure no impact on surrounding lands or waterways
  - Decide how you are going to manage waste on site
    - Compost management of green waste and how to keep animals/pests out

**Create Design Plan**

Once you’ve determined what is possible after conducting a location assessment, consider the thoughts below to assist you in developing a design plan for a greenhouse
or an alternate structure such as a sea-can system. If interested members of the community have little to no knowledge on building a greenhouse or alternate structure, it is suggested to purchase a kit and have experts install it for you.

**General Considerations**

- Decide to do it yourself (DIY) from scratch, or purchase a kit through a company which has experts available to provide consultations, assessments, and installation services
- Assess the cost and availability of materials in or near your community (e.g., wood, metal, concrete, technology, glass, polyethylene/copolymer-films, fibreglass reinforced polyester, acrylic, polyester/Mylar, polycarbonate etc.)
- Explore options for ventilation, heating, shading, irrigation, humidification, and lighting equipment
- Determine if an automated system fits your goals/budget
- Determine a method/design system you would like to implement within the greenhouse or alternate structure to produce crops (e.g., container gardening/aquaponics/hydroponics/plant boxes in existing soil)
- Determine method of sourcing utilities such as water and power
- Determine where and how to store equipment and harvested produce

**Greenhouse Designs**

When creating a design plan for a DIY greenhouse consider the following:

Greenhouse structure design plans

- **Post and rafter**
  - Description: One of the most common greenhouse structures due to the simple construction of embedded post and rafters. This design is among the strongest with the rafters lending support to the roof. As the design is top-heavy, the frame must be footed, which will increase costs relative to other design options
  - Pros: Simple straightforward design. Maximize usage of space along the side walls. More efficient air circulation, particularly along the side walls
  - Cons: Requires more material (wood and metal) vs. other designs
- **A-frame**
  - Description: One of the most common greenhouse structures, the key advantages are its simplicity of design and minimization of materials versus other similar structures (Post & Rafter). The popularity really falls on the simplicity of combing and roof and side walls together to create a singular triangular structure
  - Pros: Simple straightforward design. Less material used relative to the Post and Rafter design (its most comparable design alternative)
Cons: Narrowing side walls limits the functional use of the entire greenhouse footprint. Air circulation can also be problematic in the corners.

- **Gothic arch**
  - **Description:** A variation of the Quonset design, it includes a semicircular frame manufactured from galvanized pipe or conduit. The frame is circular and usually covered with plastic sheeting.
  - **Pros:** Simple and efficient construction design. The use of plastic sheeting reduces the overall design costs substantially. The shape of the design allows water and snow to be shed from its exterior.
  - **Cons:** Sidewall height is low, which restricts storage space and headroom.

- **Hoop house**
  - **Description:** The hoop house gets its name from its shape, although houses can be constructed with straight lines using elbows to get the desired shape of the structure. Hoops are made from aluminum pipes or plastic PVC pipes and covered with a single layer of polymer plastic covering; a second layer may be added for better insulation. Hoop houses are considered one of the most inexpensive designs, with overall construction often less than $1 per square foot.
  - **Pros:** Easy to build and adapt to small land units. It is inexpensive relative to other designs. The shape of the design allows water and snow to be shed from its exterior.
  - **Cons:** Design is inherently not as sturdy as the A-frame or Post and Rafter.

- **Lean-to greenhouse/attached greenhouse**
  - **Description:** This greenhouse shares a wall with your residence, traditionally built off the back of the home, but can be built on the side depending on the orientation of the home.
  - **Pros:** As the greenhouse shares a wall with the home, overall construction costs are lower relative to stand-alone glass greenhouses (A-frame, pillar and rafter). Lean-to greenhouses are also closer to available electricity, water and heat.
  - **Cons:** Temperature control is more difficult because the wall that the greenhouse is built on may collect the sun's heat, while the greenhouse wall windows may lose heat rapidly.

- **Window greenhouse**
  - **Description:** Called garden windows, greenhouse windows or even bay windows, they are an excellent option for growing herbs and small plants within the home. Instead of being a normal single pane of glass, the window juts off the exterior wall of the home allowing maximum light penetration. Typically these designs have windows that open on both sides, allowing maximum air ventilation. One consideration of plant layout within the garden window is water runoff.
- **Pros:** Maximizes the usefulness of windows within the home, and relatively inexpensive year-round growing option versus a standalone greenhouse structure
- **Cons:** Given the limited space, growing options are limited to herbs and smaller plants

- **Windowfarm**
  - **Description:** A windowfarm is a vertical, indoor garden that allows for year-round growing in almost any window. It lets plants use natural window light, the climate control of your living space and organic “liquid soil.” It is a form of vertical hydroponic farming
  - **Pros:** The windowfarm system is truly DIY, maximizing the opportunity for people to grow their own fresh produce regardless of where they live (backyards not needed). By far the cheapest option with starter kits costing less than $199
  - **Cons:** A hydroponic system requires more components (pumps, tubes, nutrients) and maintenance than a typical soil-based greenhouse

- **Cold frame**
  - **Description:** Used to extend the gardening season, the cold frame is the simplest (and by far the cheapest) greenhouse option. A cold frame is a structural cover over your garden (glass or plastic) to protect your plants from excessively low temperatures, wind, snow and rain
  - **Pros:** The cold frame is one of the most popular designs because of its simplicity, a bottomless box with a skylight. And the costs are quite manageable—many simple designs are constructed using old windows and scrap wood
  - **Cons:** The main disadvantage of cold frames is overheating; a single sunny afternoon with closed windows can cause serious plant damage. Another disadvantage relates to the quality of the material being used, old glass and wood are particularly prone to breakage and damage

**Greenhouse framework materials**
- Wood -- be aware that you must treat the wood in order to extend the lifetime of the greenhouse. Many coatings and treatments cannot be in contact with food products and would make them unsafe for consumption
- Iron
- Galvanized steel
- PVC
- Fibreglass tubing
- Aluminum

**Greenhouse covering materials**
- Glass
- Polyethylene/copolymer-films
- Fibreglass reinforced polyester
- Acrylic
- Polyester/Mylar
- Polycarbonate

Ventilation

In order to release carbon dioxide from the greenhouse, control the temperature and humidity, and circulate the air it is essential to install adjustable ventilation to your greenhouse/alternate structure. There are 2 options for ventilation systems: natural (passive) or mechanical (powered).

- Natural
  - Relies on wind and thermal buoyancy to circulate air
- Mechanical
  - Relies on strategically placed fans to circulate the air

Heating

- Solar
- Electric
- Heating oil
- Natural gas
- Propane
- Diesel

Thermometers/thermostats

- Insure that you include thermometers in multiple areas of your greenhouse so that you can effectively monitor temperatures at all times

Temperature Control System

- If it is in the projects budget, consider installing a forced-air system. An automated temperature control system will aid in adjusting to the daily temp changes as well as the more dramatic seasonal changes

Humidity

- Humidity can be controlled by adequate ventilation, air circulation, temperature controls and various technologies. Assess which methods for controlling humidity will work best for your structure

Lighting


- Assess the need for artificial lighting by determining the following:
  - Chosen plants' light requirements
  - Average hours of sunlight per season
- Sun angle and intensity (latitude and seasonally dependant)
- Amount of structure-induced shading

- If choosing to implement artificial lighting consider what your goals are:
  - Complete replacement of solar radiation (typically necessary for sea-can structures)
  - Supplemental lighting (used in greenhouses to supplement periods of low natural light)
  - Photoperiod lighting – used to stimulate or influence photoperiod dependant plant responses such as flowering or vegetative growth

- Once the above has been decided consider which light source is the most fitting for your structure:
  - Incandescent
  - Discharge
  - Fluorescent

**Shading**

- Semi-opaque materials can be added to the glazing either as liquid coatings or in the form of fabric screens
- If choosing screens decide on internal shading system or external shading system as well as motorized or non-motorized

**Irrigation**

- Determine available water sources and the water treatment necessary: eg well, spring, river, dam, lake, pond, stream, canal, irrigation channel
- Consider using cisterns to catch rainwater to conserve water and lower costs
- If installing irrigation system, consider that equipment and setup will vary based on crop selection and growing requirements
  - **Overhead irrigation** is used for crops that are not prone to fungus and mildews including but not limited to: greens (lettuce, kale, arugula, broccoli, spinach, and chard), beets, radishes, carrots, onions, cabbage, garlic, potatoes, select herbs etc.
  - Crops that prefer **drip irrigation**: tomatoes, eggplants, peppers cucumbers, melons, pumpkins, squash, zucchini, and basil. Summer crops (June, July, and August) tend to prefer drip irrigation as this is typical with their natural, seasonal growing conditions with the frequency of rain

**Alternate Structures**

- Can be designed using sea-cans (shipping containers) either independently using online resources as well as the considerations above, or options exists to purchase a kit through a company such as The Growcer: [https://thegrowcer.ca/](https://thegrowcer.ca/)
- For detailed information on the Growcer systems see APPENDIX 2: The Growcer Containerized Growing Systems
The Growcer Reefer Can Option

Article regarding reefer storage container gardens (Growcer)

Churchill, Manitoba news story

Source: https://thegrowcer.ca/
Preparation

Obtain Permits/Insurance/Liabilities

- If operating on large scale, consider exploring the following:
  - Business continuity insurance
  - Insurance for buildings/structures
  - Canada GAP and BC GAP certified packing, storage and post-harvest station
    Canada GAP: https://www.canadagap.ca/
    BC GAP: https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/good-agricultural-practices
  - Canada Food Inspection Agency (CFIA) certification necessary for vegetable processing activities
  - Municipal engineering permits are necessary for large greenhouses

- Plan and protocol development can include
  - Plant health plan, pest control plan, emergency evacuation plans, plant disease and weed prevention, sanitation protocol etc.

- The *Natural Products Marketing Act and Regulations* regulates the production of greenhouse-grown tomatoes, peppers and cucumbers
  Natural Products Marketing Act and Regulations: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/328_75

- Apply at the *BC Vegetable Marketing Commission* for an allocation to produce greenhouse vegetables
  See BC Vegetable Marketing Commission link below: http://www.bcveg.com/

- Other local, provincial, and federal legislative regulations may apply to prevent the introduction and spread of regulated pests that restrict the importation and domestic movement of specific greenhouse vegetable crops.

- Agricultural producers must follow legislation that is related to their farming operations. The *Farm Practices Protection (Right to Farm) Act* stipulates that the farm operation must meet the *Public Health Act, Integrated Pest Management Act, Environmental Management Act* and all associated regulations
  See Farm Practices Protection (Right to Farm Act) link: http://www.bclaws.ca/civix/document/id/complete/statreg/96131_01
  See Public Health Act link: http://www.bclaws.ca/civix/document/id/complete/statreg/08028_01
  See Integrated Pest Management Act link: http://www.bclaws.ca/Recon/document/ID/freeside/00_03058_01
  See Environmental Management Act link: http://www.bclaws.ca/Recon/document/ID/freeside/03053_00

- The *Fisheries Act* prohibits the discharge of harmful substances including agricultural wastes and pesticides into waters frequented by fish
  See Fisheries Act link below: http://laws-lois.justice.gc.ca/eng/acts/F-14/
• Emission standards for broilers and heaters fuelled by biomass are set by the *Environmental Management Act* and its associated *Agricultural Waste Control Regulation*.  
  See Environmental Management Act link:  
  [http://www.bclaws.ca/Recon/document/ID/freeside/03053_00](http://www.bclaws.ca/Recon/document/ID/freeside/03053_00)  
  See Agricultural Waste Control Regulation link:  
• Licencing of pressure vessels, and levels of maintenance staff required to oversee heating plants is regulated by the *Safety Standards Act*.  
  See Safety Standards Act link:  
• Local government legislation and bylaws may include noise, site coverage, and lighting.  
• Storm water runoff from greenhouses is permitted to enter municipal drainage systems as long as it does not contain nutrients or other agricultural waste. In addition, a storm water management plan must be prepared in accordance with municipal bylaws.  
• Crop residue, plastics and growing media must be handled, collected, stored, and disposed of in accordance with the *Agricultural Waste Control Regulation*. Particulate matter in boiler emissions is addressed in the *Code of Agricultural Practice for Waste Management* and in Metro Vancouver’s *Agricultural Boilers Emission Regulation Bylaw* (no. 1098, 2008).  
  See Agricultural Waste Control Regulation link:  
• Soil removal or placement of fill is a permitted agricultural activity in situations where this practice is necessary. A *Notice of Intent* must be submitted to the Agricultural Land Commission for specified farm and non-farm uses where soil or fill must be removed or introduced.  
  See Agricultural Land Commission link:  
  [https://www.alc.gov.bc.ca/alc/content/home](https://www.alc.gov.bc.ca/alc/content/home)
Materials Required

- Greenhouse or alternative structure building materials (kit or DIY)
  - If DIY consider viewing sample building plans online for ideas regarding irrigation, lighting, power units, heating and cooling, drainage, and ventilation materials
- Plant containment (depending on design plan this could be container gardening pots and plant boxes, hydroponics equipment, aquaponics equipment etc.)
- Soil
- Fertilizer
- Gardening Gloves
- Seeds/seed starting supplies
- Spade shovel(s)/flat shovel(s)
- Hand trowel(s)
- Wheel barrow(s)
- Seedling tray(s)
- Pruning shears
- Knives
- Restaurant salad spinner(s)
- Rubber tote(s)
- 22 L bucket(s)
- LED nursery light(s)
- 3.5"X3.5"X4" nursery container(s)
- Watering can/irrigation materials (scale dependant)
- Landscape fabric
- Animal fencing
- Cold storage options:
  - Depending on scale (could be one household refrigerator or multiple. Other options available such as installing a refrigeration unit for commercial operations)
  - Depending on scale is a refrigerated truck required?
- Compost system
Implementation

**Acquire Materials**
- Materials can be acquired in the form of a kit or as individual parts from a local nursery, garden store, or hardware store

**Installation**
- DIY or have expert technician’s install for you
Growing Season

Variation
- In a greenhouse system or alternate system it is possible to implement one singular crop or many complimenting types of crops that can be grown in the same climate
- The option exists to partner with surrounding communities that are also implementing greenhouses, or already have existing greenhouses established. Partnering would create the opportunity to exchange produce between communities and would allow growers to focus on producing one thing as best as they can, while receiving a diversity of products from surrounding communities
- Different seasons will determine what will be able to grow (sunlight and temp). There are ways to manipulate the traditional growing seasons (eg insulating the greenhouse, implementing grow lights, heating greenhouse year round). These additions will cost more money to implement/operate but extends the growing season to increase the likelihood turning a profit year round

Heated/Non-Heated
- If you are operating your system without heating, your crops will be limited to following the traditional planting seasons and will not have much (if any) return during the winter months
- Heating your structure will cost more to operate, however, may extend your growing season as well as create the ability to generate product year round
- The Growcer system is designed for Arctic conditions with a cold-weather entryway, and R20 insulation to operate from -52°C to +40°C

Date to Maturity
- Depending on what you choose to implement in your structure, the date to maturity will differ
- If you are stocking different varieties of produce, be sure to research the date to maturity for each product

Location (climate)
- Depending on the climate, growing seasons will differ in different regions if the structure is not heated/no artificial light is included in the design plan. Northern regions will experience a shorter growing season while southern BC will experience a more extended growing season

Light Source
- If your system is operating on natural light your season will have to follow the natural growing season. If your system is operating on artificial lighting your plants can be grown year round
- If relying on natural light, southern BC regions will have longer growing seasons whereas it may be necessary in northern BC regions to implement grow lights due to more prominent seasons
Crops Reach Maturity

Harvest

- Many crops offer “cut-and-come-again” practices that allow growers to realize multiple harvests from a single crop when preformed correctly. Crops that are ready to harvest can be determined by keeping track of the days to maturity date (the time needed for the plant to reach maturity). Depending on crop variety, some crops may be pulled out of the soil after they have reached their days to maturity date (radishes, potatoes, etc.) while others can be cut and picked from multiple times before the crop has to be rotated (kale, tomatoes, etc.). Other times, weather may affect the days to maturity dates as extreme heat can cause crops to bolt (early flowering) resulting in bitter, inedible crops which must be rotated.
- Using storage totes and other durable, sanitized equipment, harvest each row based on crop requirement. Consultancy or online resources can demonstrate proper harvesting practices.

Distribution

- If distributing for profit, ensure that the appropriate permits have been obtained.
- Identify if it is necessary to obtain a licence through the Canadian Food Inspection Agency.
- Some companies provide food processing services such as packaging and labelling, if chosen to do this step independently, consult the Government of Canada Consumer Packaging and Labelling Act [http://laws-lois.justice.gc.ca/eng/acts/C-38/]

Preparation for Next Growing Season

- Depending on the method you choose to implement in your structure, consult:
  - container gardening [Preparation for Next Growing Season]
  - community gardens [Preparation for Next Growing Season]
  - aquaponics [Preparation for Next Growing Season]
- Consult the Regional Planning Chart [Regional Planning Chart] for appropriate plant types for current/upcoming seasons [https://www.westcoastseeds.com/garden-resources/west-coast-seeds-planting-charts/]
Budget Considerations

When creating your budget consider the following in regards to the scale of choice if required:

- Permits/Insurance costs
  o See above
- Consultant fees
  o Are the consultations included in the cost of your kit?
  o Do you have to hire an expert separately?
- Land preparation
  o Costs of purchasing land
  o Cost of clearing and leveling land
- Materials and structure cost
  o See list above for general materials
  o Dependant on structure design, scale, and desired technical capabilities
- Water costs
  o System dependant
  o City, well, natural stream or river
- Heating/cooling costs of water (dependant on electric, heating oil, natural gas, propane, or diesel)
- Replace/repair costs
- Annual maintenance
- Staffing costs
  o Budget for 12-14 hours of labour per week for farming and upkeep for the Growcer system
  o Labour required for greenhouses is scale dependant
Resources

For information on sea-can structure kits see contact information below:

Company: The Growcer
Phone: 1 (833) 476-9237
Email: info@thegrowcer.ca
Website: https://thegrowcer.ca/
**Note: Can provide assistance with grant writing for projects associated with The Growcer**

Tsawwassen Farm School
- The Tsawwassen Farm School (TFS) is a collaboration between the Tsawwassen First Nations and the Institute for Sustainable Food Systems (ISFS) at Kwantlen Polytechnic University (KPU)
- The school fuses sustainable agriculture and traditional indigenous food systems as tools to build community and create dialogue around land stewardship for the future
- The program is a combination of in-class learning and experiential practicum time
- The core learning components are:
  - Market crop production
  - Soils, water, and compost management
  - Integrated pest management
  - Farm animals-poultry, pigs, ducks
  - Apiculture-beekeeping
  - Fruit tree production
  - Farm business planting and marketing
  - Farm tools and machinery
  - Indigenous food ways
- For more information see:
  http://www.kpu.ca/tfnfarm

For information on BC’s Greenhouse Growers’ Association see:
https://bcgreenhouse.ca/growers/

For information on plant health problems caused by insects and disease in B.C.:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/plant-health-laboratory

For information on plant pest and disease management in commercial crops see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/insects-and-plant-diseases

For information on prevention, early detection, and control or eradication of many non-native invasive pests see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/invasive-pests-and-biosecurity
For information on beneficial insects and mites see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/beneficial-insects-and-mites

For information on integrated pest management see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/integrated-pest-management

For information on pesticides in agriculture see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/pesticides

For information on weed and invasive plant ID and management in BC see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/weeds

For information about new invasive plant pests in BC see:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/pest-alerts

For information about the Invasive Species Council of BC see:
http://www.bcinvasives.ca/

For information about the Pest Management Regulatory Agency of Health Canada see:

For information about the Pest Management Centre of Agriculture and Agri-Food Canada see:

For information on Plant Health from the Canadian Food Inspection Agency see:
Potential Grant Opportunities for Greenhouses and Alternative Structures

Note: These grants are subject to change.

**BC Rural Dividend Fund**

- 4th round intake closed. Date for 5th intake TBA.
- Provides $25 million/year to assist rural communities with a population of 25,000 or less to diversify local economies
- Project categories: community capacity building; workforce development; community and economic development; business sector development
- Project streams: Project development, maximum funding $10,000; single applicant, maximum funding $100,000; partnerships, maximum funding of $500,000.
- Eligible Applicants: local governments, First Nations, Not-for-profit organizations.
- For more details see link below:
  [https://www2.gov.bc.ca/gov/content/employment-business/economic-development/support-organizations-community-partners/rural-economic-development/rural-dividend](https://www2.gov.bc.ca/gov/content/employment-business/economic-development/support-organizations-community-partners/rural-economic-development/rural-dividend)

**Canadian Agricultural Partnership**

- Cost-share funding program
- A new 5-year, $3 billion investment by federal, provincial, and territorial governments to strengthen the agriculture and agri-food sector
- Federal, provincial, and territorial governments are also continuing to work towards bilateral agreements. This investment will be cost-shared on a 60-40 basis and delivered by provinces and territories to ensure programs are tailored to meet regional needs.
- Currently B.C. has not announced their bilateral agreement. Once they do, the B.C. link will become active.
- For more information see:

**Greenhouse Carbon Tax Relief Grant**

- B.C. Government has provided carbon tax relief to B.C. commercial vegetable, floriculture, wholesale nursery, and forest seedling greenhouses.
- The Greenhouse Carbon Tax Relief Grant (GCTRG) covers 80% of the carbon tax paid on natural gas and propane used for greenhouse heating and CO₂ production.
- Fuel burnt for other purposes, such as heating residential office or non-eligible production areas, vehicles, forklifts, or to produce electricity in a CHP engine is ineligible.
- For more information see:
  [https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/greenhouse-carbon-tax-relief-grant](https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/greenhouse-carbon-tax-relief-grant)
Maple Leaf Centre for Action on Food Security
Feed Opportunity Grant
- Project grants range from $25,000-$150,000
- Two funding cycles: May 1st and September 1st
- Must hold registered charity status
- For more details see: http://www.feedopportunity.com/en/#!page=the-opportunity

Vancouver Foundation
Field of Interest Grant
- Grants available for up to $300,000
- Next deadline July, 2018
- Applicable Field of Interest: Systems Change Grant.
  - Will support projects that take action to address the root causes of pressing issues by influencing the behaviours of populations, organizations, and institutions.
- For more details see: https://www.vancouverfoundation.ca/grants/field-interest-grants

Co-op Community Spaces Grant
- Check periodically for application intake dates
- Up to $150,000/project
- Targeted at small-scale community agriculture initiatives in both rural and urban spaces eg. community gardens, food, education facilities
- Applicable funding stream: urban agriculture
- Eligibility:
  - Must be a registered non-profit, registered charitable organization or a community service co-operative
  - Must be a capital project located in B.C., Alberta, Saskatchewan, or Manitoba
  - Project must be completed in 2 years
  - Must provide the opportunity for permanent signage
- Ineligibility:
  - Those that support religious or politically affiliated organizations
  - Projects that will have adverse environmental impacts
  - Those that are third-party fundraising campaigns
  - Those that are led solely by municipal governments and do not have a charitable or non-profit partner (local non-profits and charities partnering with their local municipality must apply on behalf of the project)
- For more details see: https://www.co-op.crs/communityspaces/funding
Western Diversification Program

- Check periodically for application intake dates
- Western Diversification provides non-repayable contributions through the WDP program
- No set minimum or maximum contribution from Western Diversification
- Applicable funding streams- Clean Technology Priority, and Indigenous Economic Growth (IEG) Priority

Clean Technology Priority: clean technology in any product, process, or service that reduces environmental impacts relative to the standard and/or most commonplace technology in a given market
  - Objectives-project must address one or more of the following
    - Support the development and/or commercialization of new clean technology products and processes that will surpass the current marketplace standard and/or most commonplace technology
    - Strengthen the clean technology sector to help clean technology firms expand, modernize, grow, export, and/or become more productive
    - Build capacity at the firm, sector, and community level to foster growth in the clean technology sector by increasing access to capital, talent and markets

Indigenous Economic Growth (IEG) Priority:
  - Objectives-project must address one or more of the following
    - Strengthen Indigenous business development and entrepreneurship
    - Increase Indigenous participation in economic opportunities such as significant natural resource developments, tourism attractions, government procurement, or opportunities in the technology sector

- For more details see: http://www.wd-deo.gc.ca/eng/301.asp

Canadian Red Cross

Some of the long-term food security initiatives may be eligible for Red Cross wildfire recovery funding, depending on the details. Please see the website and email bccommunitypartners@redcross.ca to discuss any wildfire recovery or long-term food security project that you are wishing to carry out.
Container Gardening

About Container Gardening

Container gardening is a very flexible way of gardening which fits anywhere from front porches or backyards, to fields or greenhouses. This style of gardening often results in less weeding and higher crop yields. Container gardening can be put together in a DIY - Do It Yourself style, or you can purchase kits that are set up by a consultant for individual families or whole communities. Depending on your choice of seeds or starter plants, food may be harvested the first year.

Benefits of Container Gardening

Health Benefits

- Locally grown food creates transparency in terms of knowing what, if any, pesticides/genetic modification/chemicals are involved with the production of your food.
- Access to seasonal fruit, vegetables and medicinal plants, or year round access to produce if your community decides to operate in a greenhouse, shipping container, or other alternative structure.

Education and Employment Opportunities

- To train interested community members including all ages and genders.
- To implement community gardens in schools. Educate youth on practical skills including the importance of plant-based nutrition, growing seasons, gardening techniques, and composting techniques. Ensures students have access to fruits and vegetables once harvestable. See Potential Grant Opportunities for Container Gardening for information on potential K-12 grants.
- To establish a community garden to provide enhanced nutrition for community members as well as herbs and medicinal plants.
- To employ community members for day-to-day operations, or if the project expands to a large-scale operation.
- See Container Gardening Resources for information on the Tsawwassen Farm School for potential education opportunities

Opportunity for Growth

- To adapt container gardening practices to suit families, a single community, or multiple communities.
- To increase the opportunity to sell, trade, or share products between multiple communities.
- To provide fruits, vegetables, and herbs to restaurants seeking local/regionally traditional foods.
Environmental Benefits

- Reduces the 'Food Miles' or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.
- Significantly less water is required for container planting than traditional gardening methods.

Increasing Food Security

- Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.
- Since container gardens are easily moved, unlike traditional harvesting from the ground, the containers can be relocated to adapt to environmental changes. In addition, if containers are raised or implemented in a greenhouse, sea-can shipping container, or alternative structure, they are less likely to be destroyed by flood or extreme weather events.
- Opportunity to grow year round.
- ½ an acre can yield enough food for 100 families.

Traditional Indigenous Knowledge Sharing Opportunity

- Opportunity for elders to pass down traditional horticultural knowledge to youth regarding regional native edible plants growing/harvesting seasons as well as medicinal plant knowledge.
Container Gardening Examples

Examples

Source: https://pxhere.com/en/photo/749504

Source: https://commons.wikimedia.org/wiki/File:Tomato_plants_growing_July_2013_in_garbage_cans.JPG

Source: www.microgreens.com
Assessing Needs and Determining Goals

Consultations or Training

- How is your community going to obtain education/training?
  - Option to book consultations with experts or to do independent research online.
  - See Container Gardening Resources for information on the Tsawwassen Farm School for potential education opportunities.

Governance Structure
See Considerations for All Long-Term Food Security Initiatives

Scale Considerations

Scale Options:
- Small: Individual families
- Medium: Community garden
- Large: Commercial (For distribution)

- Assess the number of people that need to be fed
  - Project could be designed for individual families, community garden, for local restaurants, and for commercial sale.
  - Recommend starting small to feed families/community and expanding from there if project is successful.

- Do you want to work with other communities?
  - Communities working together can decide to focus on one type of produce and sell, trade, or share produce with another community who is growing something different. This allows growers to focus on producing one thing as best as they can, while receiving a diversity of products from surrounding communities

- Production goals:
  - Year round or seasonal?
  - What are your harvesting goals?
• Determine whether you want to purchase a kit and/or book consultations through experts such as West Coast Microgreens, or take on a DIY approach. (Scale and growing season goals will lead to the decision of implementing a greenhouse, sea-can storage container, or alternative structure)

Assess Location
• Regional/seasonal climate
• What animals/predators/pests could potentially harm your crops?
  o Do you need to purchase animal fencing?
  o Consider how to keep animals out of compost
• What square footage do you have access to?
• Considerations for building on the foundation of the existing landscape should include: access to water (city, well, natural stream or river), access to power, access to storage (cold, dry), the availability of labour, and access to distribution (refrigerated trucking, regular vehicles).
• Land with grass, weeds, or contaminated soil should be covered with landscape fabric to prevent weed seeds and other contaminants from leaching.
• Decide how you are going to manage waste on site:
  o Compost management of green waste

Create Design Plan
• Option to book consultation with experts or create design plan independently by accessing resources from local nurseries, or online resources
• Depending on scale and desired growing season decide on whether your project requires to be operated in a greenhouse, sea-can shipping container, or alternative structure
  o Greenhouses, sea-can shipping containers, and alternative structures may enable growers to extend their growing season, increasing production and ultimately earning capacity
  o If implementing a greenhouse, sea-can shipping container, or alternative structure, consider access to power
• Irrigation Considerations:
  o Determine available water sources and the water treatment necessary: e.g. well, spring, river, dam, lake, pond, stream, canal, irrigation channel
  o If installing irrigation system, consider that equipment and setup will vary based on crop selection and growing requirements. Overhead irrigation is used for crops that are not prone to fungus and mildews including but not limited to: greens (lettuce, kale, arugula, broccoli, spinach, and chard), beets, radishes, carrots, onions, cabbage, garlic, potatoes, select herbs etc. Crops that prefer drip irrigation: tomatoes, eggplants, peppers cucumbers, melons, pumpkins, squash, zucchini, and basil. Summer crops (June, July, and August) tend to prefer drip irrigation as this is
typical with their natural, seasonal growing conditions with the frequency of rain

- If outdoors, consider animal fencing
- Determine appropriate plants for the region/season (consult the Regional Planning Chart for optimal results). See APPENDIX 3: West Coast Seeds Vegetable Planning Charts

https://www.westcoastseeds.com/garden-resources/west-coast-seeds-planting-charts/
Preparation

Permits, Insurance, and Liability Considerations

- No permits, insurance or liabilities unless for outside distribution/sales
- If operating on large scale, consider exploring the following:
  - Business continuity insurance
  - Insurance for buildings/structures (refer to the Greenhouses and Alternate Structures project for permits, insurance, liabilities)
  - Canada GAP and BC GAP certified packing, storage and post-harvest station
    - Canada GAP: https://www.canadagap.ca/
    - BC GAP: https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/good-agricultural-practices
  - CFIA certification- necessary for vegetable processing activities
  - Municipal engineering permit-necessary for rooftop farms and large greenhouses

Suggested Materials

- Containers/
- Soil
- Fertilizer
- Gardening Gloves
- Seeds
- Spade shovel(s)/flat shovel(s)
- Hand trowel(s)
- Wheel barrow(s)
- Seedling tray(s)
- Pruning shears
- Knives
- Restaurant salad spinner(s)
- Rubber tote(s)
- 22 L bucket(s)
- LED nursery light(s)
- 3.5"X3.5"X4" nursery container(s)
- Watering can/irrigation materials (scale dependant)
- Landscape fabric
- Animal fencing
- Cold storage options:
  - Depending on scale (could be one household refrigerator or multiple. Other options available such as installing a refrigeration unit for commercial operations)
  - Depending on scale is a refrigerated truck required?
- Compost system
Implementation

Acquire Materials
   o Materials can be acquired in the form of a kit or as individual parts from a local nursery, garden store, or hardware store

Installation
   • Small Scale:
     o Can be set up in hours
     o Establish a location that is free of rabbits, deer and has good sun exposure
     o Plants seeds in container
   • Medium Scale:
     o Set-up may take 1-2 days
     o Animal fencing set-up if required
     o Irrigation set-up if required
     o Plant seeds in containers
   • Large Scale:
     o Set-up may take 2-3 days (excluding set up of potential structure)
     o Animal fencing set-up if required
     o Irrigation set-up if required
     o Plant seeds in containers

Growing Season

Daily Labour Requirements
   • Crops will require daily hand watering (unless irrigation system is implemented)
   • Check for weeds, pests, disease

Seasonal Labour Requirements
   • Crops must be rotated on a harvest on a days to maturity basis. Average days to maturity is 65 days.
   • Soil will need to be amended after each rotation meaning, once you have completely harvested a crop, you must take it out of the container/pot and add approximately 4.5 GL of fresh soil to re-establish the nutrients that were taken out of the soil from the previous crop.
   • Growing outdoors will typically offer BC growers a season from mid-March to the end of October. Growing in a greenhouse can achieve a 12 month growing season with the right light, heat and humidity conditions. Unheated, a greenhouse may at least extend the growing season.

Mature Crops

Harvest
   • Many crops offer “cut-and-come-again” practices that allow growers to realize multiple harvests from a single crop when preformed correctly. Crops that are
ready to harvest can be determined by keeping track of the days to maturity date (the time needed for the plant to reach maturity). Depending on crop variety, some crops may be pulled out of the soil after they have reached their day to maturity date (radishes, potatoes, etc.) while others can be cut and picked from multiple times before the crop has to be rotated (kale, tomatoes, etc.). Other times, weather may affect the days to maturity dates as extreme heat can cause crops to bolt (early flowering) resulting in bitter, inedible crops which must be rotated.

- Harvesting is best done early in the day as heat will not affect crop harvest through wilting due to sun exposure.
- Using storage totes and other durable, sanitized equipment, harvest each row based on crop requirement. Consultancy or online resources can demonstrate proper harvesting practices.

**Distribution**

- If distributing for profit, ensure that the appropriate permits have been obtained
- Identify if it is necessary to obtain a licence through the Canadian Food Inspection Agency.
- Some companies provide food processing services such as packaging and labelling, if chosen to do this step independently, consult the Government of Canada Consumer Packaging and Labelling Act. [http://laws-lois.justice.gc.ca/eng/acts/C-38/](http://laws-lois.justice.gc.ca/eng/acts/C-38/)

**Preparation for Next Growing Season**

- Soil will need to be amended after each rotation meaning, once you have completely harvested a crop, you must take it out of the container/pot and add approximately 1 GL of fresh soil to re-establish the nutrients that were taken out.
- Consult the Regional Planning Chart [Regional Planning Chart](https://www.westcoastseeds.com/garden-resources/west-coast-seeds-planting-charts/) for appropriate plant types for current/upcoming seasons. See APPENDIX 3: West Coast Seeds Vegetable Planning Charts [https://www.westcoastseeds.com/garden-resources/west-coast-seeds-planting-charts/](https://www.westcoastseeds.com/garden-resources/west-coast-seeds-planting-charts/)
Budget Considerations
When creating your budget consider the following in regards to the scale of choice if required:

- Permits/Insurance Costs
- Consultant fees and Grant writers fees
- Land Preparation
- Materials (see list above)
- Watering Costs (see irrigation considerations)
- Heating/Cooling Costs (see greenhouse project for estimates)
- Replace/Repair Costs
- Annual Maintenance
- Staffing Costs (if operating on large scale)

Suggested Contacts
If developing your container garden on a medium or large scale, contact the experts below in your region.

- Regional Bylaw Officers
- Gardening Stores
- Native Plant and Seed Experts
- Irrigation Experts
- Greenhouse Experts/Alternative Structure Experts

Container Gardening Resources
For a Do-It-Yourself approach
Local hardware stores, gardening centres including at large stores, feed stores

West Coast Microgreens
Contact: Ty James
Email: info@westcoastmicrogreens.com
Website: www.microgreens.com
**Note: Can provide services to assist with grant writing for projects associated with West Coast Microgreens**

Tsawwassen Farm School
- The Tsawwassen Farm School (TFS) is a collaboration between the Tsawwassen First Nations and the Institute for Sustainable Food Systems (ISFS) at Kwantlen Polytechnic University (KPU)
- The school fuses sustainable agriculture and traditional indigenous food systems as tools to build community and create dialogue around land stewardship for the future
- The program is a combination of in-class learning and experiential practicum time
- The core learning components are:
• Market crop production
• Soils, water, and compost management
• Integrated pest management
• Farm animals-poultry, pigs, ducks
• Apiculture-beekeeping
• Fruit tree production
• Farm business planting and marketing
• Farm tools and machinery
• Indigenous food ways

For more information see:
http://www.kpu.ca/tfnfarm
Potential Grant Opportunities for Container Gardening

Note: These grants are subject to change

Maple Leaf Centre for Action on Food Security:
Feed Opportunity Grant
- Project grants range from $25,000-$150,000
- Two funding cycles: May 1st and September 1st
- Must hold registered charity status
- For more details see link
https://www.feedopportunity.com/en/?t=Feed+Opportunity+%E2%80%93+Apply+for+Funding&d=

BC Interior Community Foundation
- Project grants from $600 or possibly more
- Grants awarded April 1st and October 1st
- Supports community-based programs in the areas of arts and culture, health and welfare, sports and recreation and others.
- Granting is available to the residents of the Thompson, Nicola, and South Cariboo region and within the communities of Lillooet, Lytton, Clinton, 70 Mile House, Ashcroft, Cache Creek, Kamloops, Clearwater, Barriere, Chase, Logan Lake and Merritt.
- Must be partnered with a registered charity
- For more details see the link below
https://www.bcicf.ca/guidelines/

Aboriginal Business and Entrepreneurship Development (ABED)
- Individual Aboriginal entrepreneurs may receive up to $99,999
- Community owned businesses can receive up to $250,000
- Encouraged to talk to an Aboriginal Financial Institution (AFI) before applying. For AFI contact info see link below
- Applicants must be of Canadian Aboriginal heritage – Status or Non-status Indian, Métis or Inuit- or a majority-owned Aboriginal business, or an Aboriginal community and/or development corporation.
- For more details see the link below
https://www.canada.ca/en/indigeno us-us-services-canada.html

BC Rural Dividend Fund
- 4th round intake closed. Date for 5th intake TBA.
• Provides $25 million/year to assist rural communities with a population of 25,000 or less to diversify local economies
• Project categories: community capacity building; workforce development; community and economic development; business sector development
• Project streams: Project development, maximum funding $10,000; single applicant, maximum funding $100,000; partnerships, maximum funding of $500,000.
• Eligible Applicants: local governments, First Nations, Not-for-profit organizations.
• For more details see link below
  https://www2.gov.bc.ca/gov/content/employment-business/economic-development/support-organizations-community-partners/rural-economic-development/rural-dividend

Vancouver Foundation
Field of Interest Grant
• Grants available for up to $300,000
• Next deadline July, 2018
• Applicable Field of Interest: Systems Change Grant.
  o Will support projects that take action to address the root causes of pressing issues by influencing the behaviours of populations, organizations, and institutions.
• For more details see link below
  https://www.vancouverfoundation.ca/grants/field-interest-grants

GO Grants
• Objective: getting classrooms outdoors
• GO Grant funding covers:
  o Transportation to field trip location: bus, train, boat, or mileage
  o Outdoor field trip equipment (eg drip nets, hand magnifiers etc.) or habitat stewardship project materials eg. Native plants, student gloves for planting
  o Outdoor fieldtrip leader, secondary school (gr. 9-12) T.O.C. costs and or program fees
  o Grants for an individual class and or requests of $600 or less
  o Grants for school-wide, district wide, or multiple classes greater than $600 to a max of $3500
• The key criteria for GO grants include trips or projects that are:
  o Conducted outdoors in a nature setting
  o Focused on learning about BC’s fish, wildlife habitats or biodiversity
  o Linked to curriculum
  o Hands-on or experiential for students
  o Planned with before and after learning extensions
• GO Grants is an online application process. Apply at
  https://hctfeducation.ca/go-grants/apply-for-grants/
- Applicants will be notified of their application status via email within 2 weeks of the deadline closing

**Co-op Community Spaces Grant**
- Check periodically for application intake dates
- Up to $150,000/project
- Targeted at small-scale community agriculture initiatives in both rural and urban spaces eg. community gardens, food, education facilities
- Applicable funding stream: urban agriculture
- Eligibility:
  - Must be a registered non-profit, registered charitable organization or a community service co-operative
  - Must be a capital project located in B.C., Alberta, Saskatchewan, or Manitoba
  - Project must be completed in 2 years
  - Must provide the opportunity for permanent signage
- Ineligibility:
  - Those that support religious or politically affiliated organizations
  - Projects that will have adverse environmental impacts
  - Those that are third-party fundraising campaigns
  - Those that are led solely by municipal governments and do not have a charitable or non-profit partner (local non-profits and charities partnering with their local municipality must apply on behalf of the project)
- For more details see: [https://www.co-op.crs/communityspaces/funding](https://www.co-op.crs/communityspaces/funding)

**Western Diversification Program**
- Check periodically for application intake dates
- Western Diversification provides non-repayable contributions through the WDP program
- No set minimum or maximum contribution from Western Diversification
- Applicable funding streams- Clean Technology Priority, and Indigenous Economic Growth (IEG) Priority
- **Clean Technology Priority**: clean technology in any product, process, or service that reduces environmental impacts relative to the standard and/or most commonplace technology in a given market
  - Objectives-project must address one or more of the following
    - Support the development and/or commercialization of new clean technology products and processes that will surpass the current marketplace standard and/or most commonplace technology
    - Strengthen the clean technology sector to help clean technology firms expand, modernize, grow, export, and/or become more productive
- Build capacity at the firm, sector, and community level to foster growth in the clean technology sector by increasing access to capital, talent and markets

- **Indigenous Economic Growth (IEG) Priority:**
  - Objectives—project must address one or more of the following
    - Strengthen Indigenous business development and entrepreneurship
    - Increase Indigenous participation in economic opportunities such as significant natural resource developments, tourism attractions, government procurement, or opportunities in the technology sector

- For more details see:

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**Canadian Red Cross**

Some of the long-term food security initiatives may be eligible for Red Cross wildfire recovery funding, depending on the details. Please see the [website](http://www.wd-deo.gc.ca/eng/301.asp) and email [bccommunitypartners@redcross.ca](mailto:bccommunitypartners@redcross.ca) to discuss any wildfire recovery or long-term food security project that you are wishing to carry out.
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Native Edible and Medicinal Plants

About Native Edible and Medicinal Plants
Different for every region, but based on your community’s history, you can choose to rejuvenate or to re-introduce plants for nutrition or for medicine. Plants may be acclimatized to the open spaces or contained and protected in a greenhouse or an open community garden, in container or microgreen planters. Lists of available plants are provided by each region.

Benefits of Harvesting Native Edible and Medicinal Plants

Health Benefits
- Locally grown food creates transparency in terms of knowing what, if any, pesticides/genetic modification/chemicals are involved with the production of your food.
- Access to seasonal fruit, vegetables and medicinal plants, or year round access to produce if your community decides to implement a greenhouse or alternative structure.

Education and Employment Opportunities
- To train interested community members including all ages and genders.
- To implement small Native Gardens in schools. Educate youth on practical skills including the importance of plant-based nutrition, growing seasons, gardening techniques, nitrogen cycles, companion planting, and composting techniques. Ensures students have access to foods once harvestable.
- To educate regarding medicinal uses of plants under the guidance of knowledgeable elders.
- To employ members of the community if operating on medium to large scale.

Opportunity for Growth
- To adapt the size of the project from small scale back yard family projects, to medium scale community projects, to large scale commercial operations.
- To establish a community garden to provide enhanced nutrition for community members as well as herbs and medicinal plants.
- To employ community members for day-to-day operations, or if the project expands to a large-scale operation.
- To increase the opportunity to trade or sell products between multiple communities.
- To supply to restaurants that would not otherwise be able to access such a niche market from wholesalers.
Environmental Benefits
- Reduces the 'Food Miles' or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.

Increasing Food Security
- Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.

Traditional Indigenous Knowledge Sharing Opportunity
- Opportunity for elders to pass down traditional horticultural knowledge to youth regarding regional native edible and medicinal plants growing/harvesting seasons as well as medicinal plant knowledge. Opportunity to educate upcoming generations on the value of companion planting.

Governance Structure
See Considerations for All Long-Term Food Security Initiatives
Traditional Native Edible and Medicinal Plant Resources  
(Listed alphabetically within Emergency Management BC Regions)  
Canadian Wildlife Federation website:  

<table>
<thead>
<tr>
<th>Central Region</th>
</tr>
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</table>
| Grasslands Nursery  
Summerland  
Address: 3615 Gartrell Road, Summerland, V0H 1Z4  
Phone Number: (250) 494-4617  
Alternative Phone Number: (250) 494-4608  
Email: grassnursery@telus.net |
| Natural Habitat Gardens  
Sorrento  
Address: R.R.#1, S15A, C35, Sorrento, V0E 2W0  
Phone Number: (250) 835-2221  
Email: naturalhabitatgardens@cablelan.net |
| Rooted by the River Nursery  
Clearwater  
Address: Box 8, Clearwater, V0E 1N0  
Phone Number: (250) 674-4089  
Alternative Phone Number: (250) 674-4047  
Email: jeff@rootedbytheriver.ca  
Contact Name: Jeff Lamond |
| Stewart Brothers Nurseries Ltd.  
Kelowna  
Address: PO Box 1360, Postal Centre 45 Stewart rd. W., Kelowna, V1Y 7V8  
Phone Number: (250) 764-2121  
Email: stewartbros@shaw.ca  
Contact Name: Kal Jhaj |
| Violet Creek Nursery  
Grindrod  
Address: Box 35, Grindrod, V0E 1Y0  
Phone Number: (250) 838-6101  
Email: shuswapnativeplants@yahoo.ca |
### North East
No listings found

### North West
No listings found

### South East

<table>
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<th>Nursery Name</th>
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<th>Alternative Phone Number</th>
<th>Email</th>
<th>Website</th>
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<tbody>
<tr>
<td>Bluestem Nursery</td>
<td>Christina Lake</td>
<td>1946 Fife Road, Christina Lake, V0H 1E3</td>
<td>(250) 447-6363</td>
<td>(250) 447-6363</td>
<td><a href="mailto:info@bluestem.ca">info@bluestem.ca</a></td>
<td><a href="http://www.bluestem.ca">http://www.bluestem.ca</a></td>
</tr>
<tr>
<td>Rocky Mountain Seed Service</td>
<td>Golden</td>
<td>P.O. Box 141, Golden, V0A 1H0</td>
<td>(604) 826-6766</td>
<td>(604) 820-2497</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tipi Mountain Native Plants</td>
<td>Cranbrook</td>
<td>8425 LD Ranch/Mission Road on St. Mary’s Reserve</td>
<td>(250) 427-7010</td>
<td></td>
<td><a href="mailto:info@tipimountain.com">info@tipimountain.com</a></td>
<td><a href="http://tmnp.tipimountain.com/products/">http://tmnp.tipimountain.com/products/</a></td>
</tr>
<tr>
<td>Twin Sisters Nursery</td>
<td>Moberly Lake</td>
<td>PO Box 298, 2118 N Hwy 29, Moberly Lake, BC</td>
<td>250 788 2244</td>
<td></td>
<td><a href="mailto:info@twinsistersnursery.com">info@twinsistersnursery.com</a></td>
<td><a href="http://www.twinsistersnursery.com/">http://www.twinsistersnursery.com/</a></td>
</tr>
</tbody>
</table>
South West

Alpenflora Gardens
Surrey
Address: 17985-40th Avenue, Surrey, V3S 0L5
Phone Number: (604) 576-2464
Alternative Phone Number: (604) 576-9691

Amsterdam Greenhouses & Garden Centre
Pitt Meadows
Address: 19100 Old Dewdney Trunk Road, V3Y 2R8
Phone Number: (604) 465-6614
Alternative Phone Number: (604) 465-6768
Email: info@amsterdamgreenhouses.com
Website: www.amsterdamgreenhouses.com

Arcto Enterprises
Abbotsford
Address: 31045 Sidoni Avenue, Abbotsford, V2T 5K1
Phone Number: (604) 854-5728
Alternative Phone Number: (604) 852-1553
Email: arcto@telus.net

B.C.’s Wild Heritage Plants
Sardis
Address: 47330 Extrom Road, Sardis, V2R 4V1
Phone Number: (604) 858-5141
Alternative Phone Number: (604) 858-5141
Email: bcwildplants@uniserve.com
Website: http://www.bcwildheritage.com

Fragrant Flora
Roberts Creek
Address: RR#2, 3741 Sunshine Coast Hwy, Roberts Creek, V0N 2W2
Phone Number: (604) 885-6142
Alternative Phone Number: (604) 885-6142
Email: fragrantflora@sunshine.net
Website

Grow & Gather (Trice Farms Ltd)
Maple Ridge
Address: 24565 Dewdney Trunk Road, Maple Ridge, V4R 1W9
Phone Number: (604) 466-3254
Email: growandgather@telus.net
Contact Name: Renata Triveri
Website: www.growandgather.com
Leigh Joseph  
Squamish Nation  
Indigenous Food Security and Sovereignty Expert  
Held the Skwxwú7mesh Traditional Plant Foods and Medicines Celebration  
Phone Number: (250)532-3468  
Email: leighjennyjoseph@gmail.com  
Website: https://www.leighjoseph.com/

Meadowsweet Farms Garden Nursery  
S. Langley  
Address: 19656-16th Avenue, S. Langley, V2Z 1K1  
Phone Number: (604) 530-2611  
Alternative Phone Number: (604) 514-1768  
Email: meadsweet@pacificgroup.net  
Website: http://www.meadowsweetfarms.com

NATS Nursery LTD:  
Langley  
Address: 24555 32nd Avenue, BC V2Z 2J5  
Phone: (604) 530-9300  
Fax: (604) 530-9500  
Website: http://natsnursery.com/

Pacific Rim Native Plant Nursery  
Chilliwack  
Address: 44305 Old Orchard Road, Chilliwack, V2R 1A9  
Phone Number: (604) 792-9279  
Alternative Phone Number: (604)792-1891  
Email: plants@hillkeep.ca  
Website: http://www.hillkeep.ca

Peel's Nurseries Ltd.  
Mission  
Address: 11610 Sylvester Road, Mission, V2V 4J1  
Phone Number: (604) 820-7381  
Alternative Phone Number: (604)820-7382  
Email: peels@uniserve.com  
Website: http://www.peelsnurseries.com

PRT Reid Collins Nursery  
Aldergrove  
Address: Box 430, 2392-272 Street, Aldergrove, V4W 2T9  
Phone Number: (60) 856-6408  
Alternative Phone Number: (800) 665-6503 / (604) 856-4218  
Email: reid.collins@PRTgroup.com  
Website: http://www.prtgroup.com
Robert Glenn
Matsqui
Address: PO Box 228, Matsqui, V4K 3R2
Phone Number: (604) 826-6766
Alternative Phone Number: (604) 820-2497

Shop in the Garden UBC Botanical Garden
Vancouver
Address: 6804 SW Marine Drive, Vancouver, V6T 1Z4
Phone Number: (604) 827-3907
Email: tamara.litke@ubc.ca
Contact Name: Tamara Litke Sustainability and Community Program Assistant
Website: http://www.ubcbotanicalgarden.org

Split Rock Environmental
Lillooet
Address: P O Box 798, 1119 Highway 99 South, Lillooet BC | V0K 1V0
Phone Number: (250) 256-0002
Email: office@splitrockenvironmental.ca
Website: http://splitrockenvironmental.ca/

VanDusen Botanical Garden Volunteer Seed Collectors
Vancouver
Address: 5251 Oak Street, Vancouver, V6M 4H1
Phone Number: (604) 878-9274
Alternative Phone Number: (604) 266-4236
Email: Seeds@PlantExplorers.com
Website: http://www.planterexplorers.com/Seedstore_001/index.html

The Wildbird Habitat Store
Chilliwack
Address: 8810-C Young Road, Chilliwack, V2P 4P5
Phone Number: (604) 792-1239
Alternative Phone Number: (604) 792-3436
Email: jasono@imag.net
Website: http://www.wildbirdstore.com

Yoshizawa Nurseries Ltd.
Langley
Address: 23105 - 68 Avenue, Langley, V2Y 2J6
Phone Number: (604) 951-0068
Alternative Phone Number: (604) 585-4411
Vancouver Island

B. Dinter Nursery Ltd.
Duncan
Address: 2205 Phipps Road, Duncan, V9L 6L2
Phone Number: (250)748-2023
Alternative Phone Number: (250) 748-0586
Email: info@dinternursery.ca
Contact Name: Bernie Dinter
Website: www.dinternursery.ca

Butchart Gardens
Victoria
Address: PO Box 4010, Victoria, V8X 3X4
Phone Number: (250) 652-4422
Alternative Phone Number: (250) 652-1475
Email: email@butchartgardens.com
Website: http://www.butchartgardens.com

Cheryl Bryce
Songhees Nation
Camas resurgence and Indigenous food sovereignty expert
E-mail: Cheryl.Bryce@songheesnation.com
Phone Number: (250)386-1043

Gardenworks
Victoria
Address: 4290 Blenkinsop Road, Victoria, V8X 2C4
Phone Number: (250) 721-2140
Alternative Phone Number: (250) 721-2821
Website: https://www.gardenworks.ca/

NALT Native Plant Nursery
Nanaimo
Address: 140 Wallace St., Nanaimo, V9R 2A1
Phone Number: (250) 816-6466
Email: plants@nalt.bc.ca
Website: http://www.nalt.bc.ca

Nature’s Garden Seed Co.
Victoria
Address: P.O. Box 32105, 3651 Shelbourne St., Victoria, V8P 5S2
Phone Number: (250) 595-2062 / 1 (877) 302-7333
Alternative Phone Number: (250) 595-7195 / 1 (888) 595-7195
Email: mail@naturesgardenseed.com
Website: http://www.naturesgardenseed.com
Mayo Creek Gardens
Lake Cowichan
Address: 6596 McLean Road, Box 351O, Lake Cowichan, V0R 2G0
Phone Number: (250) 749-6291
Alternative Phone Number: (250) 749-6291
Email: mayocreekgardens@shaw.ca

Russell Nursery
North Saanich
Address: 1370 Wain Rd., North Saanich, V8l 5V1
Phone Number: (250) 656-0384
Alternative Phone Number: (250) 656-0384
Email: russellnursery@telus.net
Contact Name: Brian Russell
Website: www.russellnursery.com

Saanich Native Plants
Saanich
Address: 741 Haliburton Rd., Saanich, B.C.
Phone Number: (778) 679-3459
Email: info@saanichnativeplants.com
Contact Name: Kristen and James
Website: http://saanichnativeplants.com/

Wildside Nursery
Denman Island
Address: 1770 Corrigal Road, Denman Island, V0R 1T0
Phone Number: (250) 335-1379
Email: harr@island.net

Woodgate Native Plant Services
Duncan
Address: Box 508, Duncan, V9L 3X8
Phone Number: (250) 748-2558
Email: rwoodgate@shaw.ca

Yellowpoint Propagation Ltd.
Ladysmith
Address: 13735 Quennell Road, Ladysmith, V9G 1G5
Phone Number: (250) 245-4635
Alternative Phone Number: (250) 245-5935
Email: ypp@island.net
Plant-based Nutrition
Due to the impact of the natural disasters in 2017 in the Province of British Columbia, it is recognized that many of the traditional sources of protein (fish and game) have been significantly impacted. As responsible stewards of the land, efforts are being made to allow the land, fish, and animals the time to become revitalized.

To help to balance the decreased availability of protein-sources from the land, a request was made for plant-based nutrition information. Whereas a complete “program” is not available, we have provided the links to a number of currently available resources. Some of these documents discuss various traditional food sources which not only include information about fish and meat sources of protein, but also include key sections about plant-based proteins including seaweed, roots, berries, and other traditionally used plants, as well as recipes.

The Ministry of Health - Office of the Provincial Dietitian will help to facilitate a partnership with the First Nations Health Authority and Interior Health to support development of this education program as resources allow.

If you would like more information about plant-based nutrition at this time, please contact your health care provider or call 8-1-1 and ask to speak with a registered dietitian at HealthLink BC.

Image Source: https://unsplash.com/search/photos/smoothie-bowls
Canada’s Food Guide for First Nations, Inuit and Métis

Health Link BC: Plant Based Diet Guidelines
https://www.healthlinkbc.ca/healthy-eating/plant-based-diet-guidelines

Dietitians of Canada: Healthy Guidelines for Lacto-Ovo Vegetarians
emphasizes plant, egg and milk protein sources
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Community Gardens

About Community Gardens
Community Gardens can be established indoors or outdoors, by individuals, groups/classes, or families who have insufficient space or unsuitable growing conditions for a productive garden in their own yards. The shared experience of a community garden decreases mental stress, is good for the body, and is good for cultivating friendships as you garden side-by-side. Community gardens provide the opportunity for food self-sustainability, friendly trading, or neighbourly sharing.

Resource: Starting A Community Garden
https://aggie-horticulture.tamu.edu/kindergarden/CHILD/COM/COMMUN.HTM

What is the definition of a community garden?
A community garden is any piece of land gardened by a group of people, utilizing either individual or shared plots on private or public land. The land may produce fruit, vegetables, and/or ornamentals.

Benefits of Community Gardens

Health Benefits
• Working within a community garden provides physical exercise and relieves mental stress
• Provides enhancement of your nutrient intake with fresh produce
• Improves self-confidence with sense of self-sufficiency, increased skills and knowledge
• Supports community cooperation and sharing, increasing sense of belonging

Education and Employment Opportunities
• To train interested community members including all age and genders.
• To include school groups and volunteers. Educate youth on practical skills including the importance of plant-based nutrition, growing seasons, gardening techniques, and composting techniques. Ensures students have access to fruits and vegetables once harvestable. See Potential Grant Opportunities for Community Gardens for information on potential k-12 GO Grants.
• To employ community members for day-to-day operations, or if the project expands to a large-scale operation.
• See Resources for information on Tsawwassen Farm School for potential training/education opportunities.

Opportunity for Growth
• To adapt gardening practices to suit a single community, or multiple communities year round.
• To increase the opportunity to trade, sell, or share products between multiple communities.
• To provide fruits, vegetables, and herbs to restaurants seeking local/regionally traditional foods.

Environmental Benefits
• Reduces the “Food Miles” or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.

Increasing Food Security
• Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.
• If container garden beds are raised off the ground, they are less likely to be damaged during harsh weather events than traditional land-based farming techniques.

Traditional Indigenous Knowledge Sharing Opportunity
• Opportunity for elders to pass down traditional horticultural knowledge to youth regarding regional native edible plants growing/harvesting seasons as well as medicinal plant knowledge.
Community Garden Timeline

Assessing Needs and Determining Goals

Consultations or Training Considerations
- How is your community going to obtain education/training?
  - To consult with your elders in the community, especially those knowledgeable about plants for both nutritional and medicinal purposes,
  - To book consultations with experts, or
  - To do independent research online
  - See Resources for information on Tsawwassen Farm School for potential training/education opportunities

Scale Consideration
- Determine the land footprint that you want to or can dedicate to a community garden
- Decide on how many people or which people you want this to serve
- Assess the size of plot required for each person, family, or group

Governance Structure
See Considerations for All Long-Term Food Security Initiatives

Terms of Use
As community gardens are meant to provide garden space for those who do not have room or appropriate conditions in their own yards, not everyone in the community may be able to have a garden plot at the same time. Some criteria will have to be determined to help decide who will be able to have a plot in the community garden, how often or under what conditions new people can have a plot, when and how you decide if you need to terminate someone’s participation in the community garden.

In order to offer a high quality community garden program, good management techniques are essential. Included in this section are the ideas to consider in management, along with many different ways to carry them out. Having written rules is very important with older groups as well as new gardens, since they spell out exactly what is expected of a gardener.
Sample Guidelines and Rules
Pick and choose what best fits your situation.

- I will pay a fee of $______ to help cover garden expenses. I understand that ____ of this will be refunded to me when I clean up my plot at the end of the season.
- I will have something planted in the garden by (date) and keep it planted all season long.
- If I must abandon my plot for any reason, I will notify the manager.
- I will keep weeds down and maintain the areas immediately surrounding my plot if any.
- I understand that the following types of plants are NOT allowed in my plot.
- I will plant tall crops where they will not shade neighbouring plots.
- I will pick only my own crops unless given permission by the plot user.
- I will not use fertilizers, insecticides or weed repellents that will in any way affect other plots.
- I agree to volunteer # hours toward community gardening efforts (include a list of volunteer tasks which your garden needs e.g. box or fence repairs).
- Consider how you will deal with potential vandalism, theft, animals (wild and pets), etc.
- Invite everyone in the neighbourhood to participate from the very beginning.
- Involve children in learning gardens. Children included in the garden process become champions of the garden. Therefore your garden may want to allocate some plots specifically for children. This could include a plot or plots for school groups or if there is a local daycare.

Location Considerations
- Choose the location of the community garden, taking into account whether you want this indoors or outdoors, the amount and direction of sunlight, access to water, additional required space for items such as compost, extra soil, garden tools and equipment
- If a community garden is to be indoors, see the Greenhouses and Alternate Structures information package.
- Regional/Seasonal Climate
- What animals/predators/pests could potentially harm your crops?
  - Do you need to purchase animal fencing?
  - Consider how to keep animals out of compost
- Land with grass, weeds, or contaminated soil should be covered with landscape fabric to prevent weed seeds and other contaminants from leeching
- Decide how you are going to manage waste on site
  - Compost management of green waste
- Depending on the size of your community and participants’ needs, determine if you need parking spaces, and allow room for delivery vehicles for things such as plants, soil, or other supplies
Create Design Plan

- Some garden beds are dug right into the ground with surrounding edges defining each plot.
- Other garden beds are raised to facilitate those with physical challenges with bending or kneeling, for wheelchair accessibility, and also to provide “storage” space for some items underneath. However, raised beds need to be sturdy to hold the weight of wet soil and must have proper drainage.
- Layout of the beds should allow for easy access, accessibility from both sides, and consideration if two or more people are working on their gardens at the same time. Space should allow for easy movement of wheelbarrows, running of hoses, wheelchairs or scooters, etc.
- If you have chosen an outdoor location, consider the overall shape to facilitate easy fencing
- Plan for the spaces between the garden plots as well. What kind of surfacing do you want? Consider easy care so that more time can be spent with the garden plots rather than on maintenance.
Preparation

Permits, Insurance, and Liability Considerations
- Explore permits, insurance or liabilities especially for outside distribution/sales
- If operating on commercial scale, need to obtain:
  - Business continuity insurance
  - Insurance for buildings/structures (if investing in a greenhouse- see greenhouse project for permits, insurance, liabilities)
  - For distributors: Canada GAP and BC GAP certified packing, storage and post-harvest station
  - Canada GAP https://www.canadagap.ca/
  - BC GAP https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/good-agricultural-practices
  - CFIA certification is necessary for vegetable processing activities
  - Municipal engineering permit is necessary for rooftop farms and large greenhouses

Suggested Materials
Some community garden groups have some communal garden tools or equipment, especially the larger items such as wheelbarrows or garden hoses.

- Containers
  - Decisions have to be made about what kind of materials will be used for the garden beds. Some people make them out of wood, some use store-bought plastic beds, and others have unusual but practical and accessible materials to make the beds e.g. old tires.

- Soil
- Fertilizer
- Gardening Gloves
- Spade shovel(s)/flat shovel(s)
- Hand trowel(s)
- Wheel barrow(s)
- Pruning shears
- Knives
- Watering can/irrigation materials (scale dependant)
- Landscape fabric
- Animal fencing
- Compost system
Implementation

Acquisition of Materials and Set-up

- Dependent on
  - If set up indoors or outdoors
    - If indoors – if utilizing an existing greenhouse or if one needs to be constructed/erected.
    - If outdoors, animal fencing set up if required
  - Bed set up (timelines will be dependent on scale)
  - Irrigation set-up – whether for individual beds, or simply garden hoses.
    Water source will also affect the set-up – are you using municipal source of water, well water, pumped from a river/creek/lake, etc.

- Gardeners independently choose bedding plants and/or seeds available local nurseries, hardware stores, grocery stores, or from other sources
Growing Season

Daily Labour Requirements
Crops may require daily hand watering (unless irrigation system implemented) depending on if indoor or outdoor, temperature, and weather.

- All participants should be encouraged to check for weeds, pests, disease to prevent spread to others’ garden plots

Seasonal Labour Requirements

- Dependent on what is grown. For vegetables, an average time to maturity is 65 days.
- Soil will need to be amended (nutrients added) after each rotation meaning, once you have completely harvested a crop as vegetables specifically absorb nutrients from the soil
- Growing outdoors will typically offer BC growers a season from mid-March to the end of October. Growing in a greenhouse can achieve a 12 month growing season with the right light, heat and humidity conditions.
Mature Crops

Harvest

- Many crops offer “cut-and-come-again” practices that allow growers to realize multiple harvests from a single crop when performed correctly. Crops that are ready to harvest can be determined by keeping track of the days to maturity date. Depending on crop variety, some crops may be pulled out of the soil after they have reached their days to maturity date (radishes, potatoes, etc.) while others can be cut and picked from multiple times before the crop has to be rotated (kale, tomatoes, etc.). Other times, weather may affect the days to maturity dates as extreme heat can cause crops to bolt (early flowering) resulting in bitter, inedible crops which must be rotated.

- Harvesting is best done early in the day as heat will not affect crop harvest through wilting due to sun exposure.

Distribution/Sharing

- Based on the decisions made by the managing committee and the individuals/families, the results of the gardens can be utilized by each person/family. Some may choose to trade or share produce with their neighbours. Regardless of the choices made, the fresh produce will be a great start to delicious and healthy meals!

Preparation for Next Growing Season

- Soil will need to be amended after each rotation meaning, once you have completely harvested a crop, it is common practice to add compost or bring in fresh soil to re-establish the nutrients that were taken out of the soil from the previous crop.

- Consult the Regional Planning Chart for appropriate plant types for current/upcoming seasons.

https://www.westcoastseeds.com/garden-resources/west-coast-seeds-planting-charts/
Budget Considerations
When creating your budget consider the following in regards to the scale of choice if required:

- Permits/Insurance Costs
- Consultant fees
- Land Preparation
- Materials (see list above)
- Watering Costs (see irrigation considerations)
- Heating/Cooling Costs (see greenhouse project for estimates)
- Replace/Repair Costs
- Annual Maintenance

Resources
Tsawwassen Farm School
- The Tsawwassen Farm School (TFS) is a collaboration between the Tsawwassen First Nations and the Institute for Sustainable Food Systems (ISFS) at Kwantlen Polytechnic University (KPU)
- The school fuses sustainable agriculture and traditional indigenous food systems as tools to build community and create dialogue around land stewardship for the future
- The program is a combination of in-class learning and experiential practicum time
- The core learning components are:
  - Market crop production
  - Soils, water, and compost management
  - Integrated pest management
  - Farm animals-poultry, pigs, ducks
  - Apiculture-beekeeping
  - Fruit tree production
  - Farm business planting and marketing
  - Farm tools and machinery
  - Indigenous food ways
- For more information see: [http://www.kpu.ca/tfnfarm](http://www.kpu.ca/tfnfarm)

Potential Grant Opportunities for Community Gardens
Note: These grants are subject to change

Maple Leaf Centre for Action on Food Security
Feed Opportunity Grant
- Project grants range from $25,000-$150,000
- Two funding cycles: May 1st and September 1st
- Must hold registered charity status
- For more details see link below [http://www.feedopportunity.com/en/#!/page=the-opportunity](http://www.feedopportunity.com/en/#!/page=the-opportunity)
BC Interior Community Foundation:
- Project grants from $600 or possibly more
- Grants awarded April 1st and October 1st
- Supports community-based programs in the areas of arts and culture, health and welfare, sports and recreation and others.
- Granting is available to the residents of the Thompson, Nicola, and South Cariboo region and within the communities of Lillooet, Lytton, Clinton, 70 Mile House, Ashcroft, Cache Creek, Kamloops, Clearwater, Barriere, Chase, Logan Lake and Merritt.
- Must be partnered with a registered charity
- For more details see the link below
  https://www.bcitcf.ca/guidelines/

Aboriginal Business and Entrepreneurship Development (ABED)
- Individual Aboriginal entrepreneurs may receive up to $99,999
- Community owned businesses can receive up to $250,000
- Encouraged to talk to an Aboriginal Financial Institution (AFI) before applying. For AFI contact info see link below
  http://www.aadnc-aandc.gc.ca/eng/1100100033216/1100100033220
- Applicants must be of Canadian Aboriginal heritage – Status or Non-status Indian, Métis or Inuit- or a majority-owned Aboriginal business, or an Aboriginal community and/or development corporation.
- For more details see the link below
  http://www.aadnc-aandc.gc.ca/eng/1375201178602/1375202816581

BC Rural Dividend Fund
- 4th round intake closed. Date for 5th intake TBA.
- Provides $25 million/year to assist rural communities with a population of 25,000 or less to diversify local economies
- Project categories: community capacity building; workforce development; community and economic development; business sector development
- Project streams: Project development, maximum funding $10,000; single applicant, maximum funding $100,000; partnerships, maximum funding of $500,000.
- Eligible Applicants: local governments, First Nations, Not-for-profit organizations.
- For more details see link below
  https://www2.gov.bc.ca/gov/content/employment-business/economic-development/support-organizations-community-partners/rural-economic-development/rural-dividend

Vancouver Foundation
Field of Interest Grant
- Grants available for up to $300,000
- Next deadline July 2018
- Applicable Field of Interest: Systems Change Grant.
Will support projects that take action to address the root causes of pressing issues by influencing the behaviours of populations, organizations, and institutions.

- For more details, see link below
  [https://www.vancouverfoundation.ca/grants/field-interest-grants](https://www.vancouverfoundation.ca/grants/field-interest-grants)

**GO Grants**

- Objective: getting classrooms outdoors

- GO Grant funding covers:
  - Transportation to field trip location: bus, train, boat, or mileage
  - Outdoor field trip equipment (eg drip nets, hand magnifiers etc.) or habitat stewardship project materials eg. Native plants, student gloves for planting
  - Outdoor fieldtrip leader, secondary school (gr. 9-12) T.O.C. costs and or program fees
  - Grants for an individual class and or requests of $600 or less
  - Grants for school-wide, district wide, or multiple classes greater than $600 to a max of $3500

- The key criteria for GO grants include trips or projects that are:
  - Conducted outdoors in a nature setting
  - Focused on learning about BC’s fish, wildlife habitats or biodiversity
  - Linked to curriculum
  - Hands-on or experiential for students
  - Planned with before and after learning extensions

- GO Grants is an online application process. Apply at [https://hctfeducation.ca/go-grants/apply-for-grants/](https://hctfeducation.ca/go-grants/apply-for-grants/)

- Applicants will be notified of their application status via email within 2 weeks of the deadline closing

**Co-op Community Spaces Grant**

- Check periodically for application intake dates
- Up to $150,000/project
- Targeted at small-scale community agriculture initiatives in both rural and urban spaces e.g. community gardens, food, education facilities
- Applicable funding stream: urban agriculture

- Eligibility:
  - Must be a registered non-profit, registered charitable organization or a community service co-operative
  - Must be a capital project located in B.C., Alberta, Saskatchewan, or Manitoba
  - Project must be completed in 2 years
  - Must provide the opportunity for permanent signage

- Ineligibility:
  - Those that support religious or politically affiliated organizations
Long-Term Food Security Initiatives

- Projects that will have adverse environmental impacts
- Those that are third-party fundraising campaigns
- Those that are led solely by municipal governments and do not have a charitable or non-profit partner (local non-profits and charities partnering with their local municipality must apply on behalf of the project)

- For more details see: https://www.co-op.crs/communityspaces/funding

**Western Diversification Program**

- Check periodically for application intake dates
- Western Diversification provides non-repayable contributions through the WDP program
- No set minimum or maximum contribution from Western Diversification
- Applicable funding streams: Clean Technology Priority, and Indigenous Economic Growth (IEG) Priority
- **Clean Technology Priority**: clean technology in any product, process, or service that reduces environmental impacts relative to the standard and/or most commonplace technology in a given market
  - Objectives: project must address one or more of the following
    - Support the development and/or commercialization of new clean technology products and processes that will surpass the current marketplace standard and/or most commonplace technology
    - Strengthen the clean technology sector to help clean technology firms expand, modernize, grow, export, and/or become more productive
    - Build capacity at the firm, sector, and community level to foster growth in the clean technology sector by increasing access to capital, talent and markets
- **Indigenous Economic Growth (IEG) Priority**:
  - Objectives: project must address one or more of the following
    - Strengthen Indigenous business development and entrepreneurship
    - Increase Indigenous participation in economic opportunities such as significant natural resource developments, tourism attractions, government procurement, or opportunities in the technology sector

- For more details see: http://www.wd-dep.gc.ca/eng/301.asp

**Canadian Red Cross**

Some of the long-term food security initiatives may be eligible for Red Cross wildfire recovery funding, depending on the details. Please see the website and email bccommunitypartners@redcross.ca to discuss any wildfire recovery or long-term food security project that you are wishing to carry out.
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Aquaponics

About Aquaponics
Aquaponics simultaneously provides two sources of food – one source is leafy greens, and the other source is fish. This kind of food production can be scaled for individual families or whole communities. Aquaponics is currently being utilized in places such as foodbanks to provide fresh vegetables and fish to customers on a weekly basis. Fish varieties include, but are not limited to Tilapia, White Bass, Barramundi, Crappies, Catfish, Trout, Jade Perch, Silver Perch, Goldfish, Koi, Murray Cod, Carp, Largemouth Bass, Blue Gill/Brim, Sunfish, Pacu, or crustaceans.

Benefits of Aquaponics

Health Benefits
- Locally grown food creates transparency in terms of knowing what, if any, pesticides/genetic modification/chemicals are involved with the production of your food. Aquaponics systems cannot use chemical pesticides in their produce as this will cause the fish to die.
- Seasonal access to vegetables and fish, or year round access if your community decides to implement an environmentally controlled greenhouse or alternate structure.
- Access to protein with the knowledge of what, if any, antibiotics/hormones/feed are involved in raising the fish you eat.

Education and Employment Opportunities
- To train interested community members including all ages and genders.
- To implement small aquaponics systems in schools. Educate youth on practical skills including the importance of plant-based nutrition, growing seasons, gardening techniques, nitrogen cycles, and composting techniques. Ensures students have access to fruits and vegetables once harvestable. See Potential Grant Opportunities for Aquaponics for information on potential K-12 GO Grants.
- To employ community members for day-to-day operations, or if the project expands to a large-scale operation.

Opportunity for Growth
- Can adapt aquaponics systems to suit families, a single community, or multiple communities.
- Can increase the opportunity to sell, trade, or share products between multiple communities.
- Can provide vegetables to restaurants seeking local/regionally grown foods.

Environmental Benefits
- Reduces the ‘Food Miles’ or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.
Significantly reduces the amount of water required compared to traditional farming practices due to the recycling of water.

No risk of harmful fertilizer runoff into local watersheds like in traditional farming practices.

**Increasing Food Security**
- Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.
- Opportunity to grow year round.
- Due to the recycling of water in the system, aquaponics systems can operate in drought regions or in areas of limited water supply.

**Traditional Indigenous Knowledge Sharing Opportunity**
- Opportunity for elders to pass down traditional horticultural knowledge to youth regarding regional native edible plants growing/harvesting seasons as well as medicinal plant knowledge.
How Aquaponics Works

Fish are fed food and produce Ammonia rich waste. Too much waste substance is toxic for the fish, but they can withstand high levels of Nitrates.

The bacteria, which is cultured in the grow beds as well as the fish tank, breaks down this Ammonia into Nitrates and then Nitrates.

Plants take in the converted Nitrates as nutrients. The nutrients are a fertilizer, feeding the plants. Also, the plant roots help filter the water for the fish.

Water in the system is filtered through the grow medium in the grow beds. The water also contains all the nutrients for the fish.

Oxygen enters the system through an air pump and during dry periods. This oxygen is essential for plant growth and fish survival.

Aquaponics Timeline

Assessing Needs and Determining Goals

Consultations or Training Considerations
- How is your community going to obtain education/training?
  - Option to book consultations with experts or use online resources

Governance Structure
See Considerations for All Long-Term Food Security Initiatives

Scale Considerations
- Scale Options:
  - Small: Individual families
  - Medium: Community sized
  - Large: Commercial (for distribution)
- Assess the number of people that need to be fed
  - Project could be designed for individual families, to feed communities, kits for local restaurants, and for commercial sale.
  - Recommend starting small to feed families/community and expanding from there if project is successful.
- Do you want to work with other communities?
  - Communities working together can decide to grow one crop and exchange and/or sell produce with another community who is focusing on something different. This allows growers to focus on producing one thing as best as they can, while receiving a diversity of products from surrounding communities.
- Production goals:
  - Year round or seasonal?
  - What are your harvesting goals?
- Determine whether you want to purchase a kit/book consultations through experts in your region, or take on a DIY approach
- Scale and growing season goals may lead to the decision of implementing an environmentally controlled greenhouse or alternate structure
**Assess Location**

- Regional/Seasonal Climate
- What animals/predators/pests/diseases could potentially harm your crops/fish?
  - Do you need to install animal fencing? (if implemented outdoors)
  - Consider how to keep animals out of compost
- What square footage do you have access to?
- Considerations for building on the foundation of the existing landscape should include: access to water (city, well, natural stream or river), access to power, access to storage (cold, dry), availability of labour, and access for distribution (refrigerated trucking, regular vehicles)
- If near a river, determine the level of flood risk
  
  For information on river forecast data see link below:
- If an outdoor set up; land with grass, weeds, or contaminated soil should be covered with landscape fabric to prevent weed seeds and other contaminants from leaching
- Decide how you are going to manage waste on site:
  - Compost management of green waste as well as fish carcasses

**Create Design Plan**

- Option to book consultation with experts or create design plan independently by accessing resources from local nurseries, libraries, or online resources
- Decide which type of aquaponics system is appropriate for your community. Variables to consider are filtration components, plumbing components, type of plant bed, amount and frequency of water circulation and aeration:
  - **Raft**: (float, deep channel, deep flow, deep water culture)
    - Minimal equipment required, and can be sourced cheaply
    - The extra volume of water in the raft tank provides a buffer for the fish, reducing stress and potential water quality problems (More stable environment for the plants and fish. Because water is not moved from the fish tank into the other systems, it does not experience fluctuations in pH or temperature)
    - Once a raft is harvested it can be replanted with seedlings and set into place on the opposite end, optimizing floor space
  - **Nutrient Film Technique**:
    - Efficient in water use
    - Primarily used to cultivate leafy greens and salad greens which have small root systems and are relatively lightweight
    - Unable to support larger, heavier plants, such as tomatoes, cucumbers, and squash
  - **Media-Filled Bed**:
    - This is the easiest system to implement, however, also produces the least produce
- The rocks (or clay pellets) that are used to line the bottom are expensive
- No additional filtration makes it easy to operate as long as no part of the bed becomes waterlogged

- Depending on scale and desired growing season decide on whether your project requires a greenhouse/alternative structure or not
  - Greenhouses/alternative structures will enable growers to extend their growing season, increasing production and ultimately earning capacity

- Decide what type of fish is appropriate for your system (decide if you want edible or non-edible)
  - Edible options include, but are not limited to: Tilapia, White Bass, Barramundi, Crappies, Catfish, Trout, Jade Perch, Silver Perch, Murray Cod, Carp, Largemouth Bass, Blue Gill/Brim, Sunfish, Pacu, or crustaceans.
  - Options that are typically not eaten include, but are not limited to: Koi, Goldfish

- Determine appropriate plants for the system
  - Plants that will thrive in any system: any leafy lettuce, pak choi, kale, swiss chard, arugula, basil, mint, watercress, chives.
  - Plants that will only do well in a heavily stocked and sturdy system: tomatoes, peppers, cucumbers, beans, peas, squash, broccoli, cauliflower, cabbage
Examples
There are endless styles of aquaponics techniques which can be further adapted to suit your community’s needs dependent on personal preference, available materials, budget, available space, location, etc.

Aquaponics Examples

Example of a raft technique (incorporate fish)
Source: [http://www.simplyhydro.com/system.htm](http://www.simplyhydro.com/system.htm)

Example of a nutrient film technique

Example of a media-filled bed design
Preparation

Permits, Insurance, and Liability Considerations
- Explore permits, insurance or liabilities especially for outside distribution/sales
- If operating on commercial scale, need to obtain:
  - Business continuity insurance
  - Insurance for buildings/structures (if investing in a greenhouse- see greenhouse project for permits, insurance, liabilities)
  - For distributors: Canada GAP and BC GAP certified packing, storage and post-harvest station
    - Canada GAP [https://www.canadagap.ca/](https://www.canadagap.ca/)
    - BC GAP [https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/good-agricultural-practices](https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/good-agricultural-practices)
  - CFIA certification is necessary for vegetable processing activities
  - Appropriate aquaculture license:
  - Municipal engineering permit is necessary for large greenhouses

Acquiring a Pacific Freshwater/Land-Based Aquaculture Licence for a Tilapia Aquaponics Facility
To determine if an aquaponics operation requires a federal aquaculture licence, please refer to the Aquaponics Licensing Flowchart see APPENDIX 4: Department of Fisheries and Oceans – Aquaponics Licensing Flowchart.

If you do require a licence, below is information on acquiring a Pacific Freshwater/Land-Based Aquaculture Licence. One thing to consider is that if in the future you have excess fish as part of your aquaponics operation and then wish to sell them, additional licensing such as an Introductions and Transfers licence, may be required for that activity. The best first step is to become familiarized with the Regulations, Introduction and Transfer website, the Conditions of Licence, and other helpful sites prior to applying. Please see below for relevant information and web links.

Below is information on applying for a Pacific Freshwater/Land-Based Aquaculture Licence:

1. Review the “Pacific Aquaculture Regulations” which are the overarching regulations that govern aquaculture management in British Columbia

2. Read through the “Freshwater Conditions of Licence”

Familiarize yourself with the Introductions and Transfer Committee as they would need to approve any movements of fish around BC (including any movement into the proposed facility). They may also have specific requirements for the facility...
to minimize escapes. You may want to contact the ITC directly to confirm any extra concerns they may have regarding Tilapia.


3. If you are importing prohibited fish into BC (such as Nile Tilapia or Koi Carp) for personal use, you will need an “Introductions and Transfers (I&T) licence” to do so. Please note that fish on the Prohibited Import Live Fish list may be subject to prohibitions and/or controls. You will require an Introductions and Transfers Licence to transport any fish within BC. As such, see the attached Department of Fisheries and Oceans (DFO) ITC application form for your use. DFO will need to consider your setup as a land-based facility. You will have to complete and submit the information in section 5d.ii regarding your introduction to liquid waste or sewage discharged into a river or the sea. It helps the ITC if you include a brief description of your setup with your application so that they can determine if there is any risk of fish escape or disease transmission. There is currently no fee for ITC applications for tilapia and they have a 10 business day standard. Contact the ITC if you have any additional questions regarding their process or their application form at: ITC@dfo-mpo.gc.ca.

Lastly, the actual application for a Pacific Freshwater/Land-based aquaculture licence is located on the Provincial website (approximately half way down the front page). See the provided links for the main page, as it is very helpful. There is also a freshwater and land based aquaculture application guide, which has more information included.

http://www2.gov.bc.ca/gov/content/industry/natural-resource-use/land-use/crown-land/crown-land-uses/aquaculture


To apply for a licence is free. If your licence application is approved, there is a $102 fee to issue a licence. Currently, all new licences issued will be in effect until June 2024.

Premises Identification

Premises Identification links livestock and poultry to geographic locations and is an important part of a full traceability system that also includes animal identification and animal movement.

If you raise livestock or poultry, or they are transported to and from your parcel of land, a Premises ID is an important step in protecting the health and safety of your animals and those of other British Columbian and Canadian producers.

B.C. livestock and poultry owners are invited to provide basic land and contact information for their premises by completing a Premises Identification Registration Form and submitting it to the Ministry of Agriculture. There is no cost to participate in the program. Information collected will assist both industry and government in the planning
and management of animal disease outbreaks or other emergencies threatening animal or human health.

**Premises ID Link**

https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/premises-id?keyword=Premises&keyword=ID&keyword=program
Aquaponics Licensing Flowchart

Do I need a licence from Department of Fisheries and Oceans?

Determine species of fish currently/to be used in aquaponics system

- Is this species of fish listed as prohibited under the Pacific Fishery Regulations http://laws-lois.justice.gc.ca/eng/regulations/crfr-43-01/page-22.html#s-38, or Controlled Alien Species Regulations: http://www.env.gov.bc.ca/fw/wildlife/review/cas/Exemption%20of%20rainbow%20trout%20(Oncorhynchus%20mykiss)%20-_shorten_.html, proceed to No.
- If the use of ornamental fish is for consumption, proceed to food fish section

Type of fish:
A) Ornamental (e.g. carp)
B) Food fish (e.g. tilapia)

If the use of ornamental fish is for consumption, proceed to food fish section.

What will be the purpose of your aquaponics system?
A) Personal Use (e.g. fertilizer) with no intention of selling fish, or B) Selling - includes the following:
- Any intention to sell fish for profit, and/or
- Selling of any fish to friends, family and neighbours or online, and/or
- Selling fish at farmers markets, supermarkets, retail markets, restaurants

- A) Personal Use
- B) Selling

- A) Personal Consumption
- B) Siting

- A) Siting
- B) Siting

- Are you gifting live fish?
- Yes: Is the recipient a licensed aquaculture facility?
- No: Do you study/intend to stock your system with sterile or monosex fish species? (lack of reproduction)
- No: Unknown

Risk assessment required Contact BC Introductions & Transfers Committee

No Freshwater/Land-based Aquaculture Licence required

- Please ensure offering is dealt with disposed in an appropriate manner
- **Please ensure that your aquaponics system is appropriately designed to minimize the risk of escape (e.g. recirculation, screening, netting)
- **If gifting, recipient to receive DFO Live Fish Gift Letter
- ***Please ensure that you and anyone you sell/gift your fish to are aware that it is an act to release live fish into natural waters of British Columbia

It is the responsibility of the aquaponics operator to obtain all other forms of authorizations from provincial/territorial agencies that may have jurisdiction over aquaponics facilities, works required to construct such facilities or requirements for the selling of fish for human consumption.

If you observe a fishery violation, you are encouraged to report it to the DFO Observer Line: 1-800-465-4326

Contact Information
Aquaculture Management Division
Freshwater Resource Manager
FreshwaterAquaculture@dfo-mpo.gc.ca
BC Introductions and Transfers Committee
IC Coordinator
Tel: 604-666-5519
Fax: 604-666-1176
Email: Introductions@dfo-mpo.gc.ca
Last Updated December 29, 2014
Materials Required

- Aquaponics kit (do-it-yourself or purchase a ready-made system)
- Gardening Gloves
- Seeds
- Fish
- Fish food
- Seedling tray(s)
- Scissor(s)
- Knives
- Restaurant salad spinner(s)
- Rubber tote(s)
- 22 L bucket(s)
- LED nursery light(s)
- 3.5”X3.5”X4” nursery container(s)
- Landscape fabric
- Animal fencing (if outdoors)
- Building structure materials if implementing in shed or greenhouse
- Cold storage options:
  - Depending on scale (could be one household refrigerator or multiple. Other options available such as installing a refrigeration unit for commercial operations)
  - Depending on scale is a refrigerated truck required?
- Compost system
Implementation

Acquisition of Materials

- Purchase kit or obtain materials necessary to build your own do-it-yourself aquaponics system

Installation

- Prepare the location
- Set up aquaponics kit/build system
- Add water
- Add growth media
- Add plants
- Begin the cycling process (introducing ammonia to the system to attract the bacteria required). Two options for starting the cycling process:
  - Using the fish to create a balanced environment:
    - More natural method of introducing ammonia to the system because there is no manual addition of outputs.
    - Stressful for the fish and often times will lose some due to too much ammonia
    - Can introduce seeds/seedlings at the same time as you add fish so that they can start rooting early and removing nitrogen-based fish waste from the system
  - Manually create the balanced environment, then introduce fish:
    - Manually input ammonia and measure the water quality.
    - Introduce fish once water quality levels are at a reasonable state to introduce your fish
Growing Season

Daily Labour Requirements
- Feed your fish
- Check water quality and temperature and treat/adjust as required
- Harvest mature crops

Seasonal Labour Requirements
- Crops must be rotated upon harvest
- Growing outdoors will typically offer BC growers a season from mid-March to the end of October. Growing in a greenhouse can achieve a 12 month growing season with the right light, heat and humidity conditions.
Mature Crops

Harvest

- Many crops enable “cut and come again” practices that allow growers to realize multiple harvests from a single crop when preformed correctly. Crops that are ready to harvest can be determined by keeping track of the maturity date. Depending on crop variety, some crops need to be fully harvested once they have reached their date to maturity (radishes, potatoes, etc.) while others can be cut and picked from multiple times before the crop has to be rotated (kale, tomatoes, etc.).
- Using rubber totes and other durable, sanitized equipment, harvest each row based on crop requirement.
- Depending on breed chosen, harvest and replace the fish once they reach maturity.

Distribution

- If distributing for profit, ensure that the appropriate permits have been obtained.
- Identify if it is necessary to obtain a licence through the Canadian Food Inspection Agency.
- Some companies provide food processing services such as packaging and labelling, if chosen to do this step independently, consult the Government of Canada’s Consumer Packaging and Labelling act (link below)
  http://laws-lois.justice.gc.ca/eng/acts/C-38/

Preparation for Next Growing Season

- This step is ongoing. Continuous rotation of plant material and of fish once they reach maturity.
Budget Considerations
When creating your budget consider the following in regards to the scale of choice if required:

- Permits/Insurance costs
- Consultant fees
- Land preparation
- Materials (see list above)
- Structure cost (if implementing a greenhouse or alternative structure)
- Water costs (system dependant)
- Heating/cooling costs of water (see greenhouse project for estimates)
- Replace/repair costs
- Annual maintenance
- Staffing costs (if operating on large scale)

Suggested Contacts
If developing your container garden on a medium or large scale, contact the experts below in your region.

- Aquaponics experts in your region
- Regional bylaw officers
- Department of fisheries and oceans (DFO)
- Local gardening stores
- Native plant and seed experts
- Greenhouse experts/alternative structure experts
- Grant writers

Resources
Information on Aquaculture licencing in BC:

Pacific Aquaculture Regulations:
http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-270/page-1.html

Information regarding land tenure and aquaculture in B.C.:
https://www2.gov.bc.ca/gov/content/industry/natural-resource-use/land-use/crown-land/crown-land-uses/aquaculture

Canadian Food Inspection Agency:
http://www.inspection.gc.ca/eng/1297964599443/1297965645317

Article re: Aquaponics at the Mississauga Foodbank:
https://aquagrowfarms.ca
Potential Grant Opportunities for Aquaponics
Note: These grants are subject to change.

Maple Leaf Centre for Action on Food Security:
Feed Opportunity Grant
- Project grants range from $25,000-$150,000
- Two funding cycles: May 1st and September 1st
- Must hold registered charity status
- For more details see link below
  www.feedopportunity.com

BC Interior Community Foundation:
- Project grants from $600 or possibly more
- Grants awarded April 1st and October 1st
- Supports community-based programs in the areas of arts and culture, health and welfare, sports and recreation and others.
- Granting is available to the residents of the Thompson, Nicola, and South Cariboo region and within the communities of Lillooet, Lytton, Clinton, 70 Mile House, Ashcroft, Cache Creek, Kamloops, Clearwater, Barriere, Chase, Logan Lake and Merritt.
- Must be partnered with a registered charity
- For more details see the link below
  https://www.bcicf.ca/guidelines/

Aboriginal Business and Entrepreneurship Development (ABED)
- Individual Aboriginal entrepreneurs may receive up to $99,999
- Community owned businesses can receive up to $250,000
- Encouraged to talk to an Aboriginal Financial Institution (AFI) before applying.
  For AFI contact info see link below
  Applicants must be of Canadian Aboriginal Heritage – Status or Non-status Indian, Métis or Inuit- or a majority-owned Aboriginal business, or an Aboriginal community and/or development corporation.
  For more details see the link below

BC Rural Dividend Fund
- 4th round intake closed. Date for 5th intake TBA.
- Provides $25 million/year to assist rural communities with a population of 25,000 or less to diversify local economies
- Project categories: community capacity building; workforce development; community and economic development; business sector development
- Project streams: Project development, maximum funding $10,000; single applicant, maximum funding $100,000; partnerships, maximum funding of $500,000.
- Eligible Applicants: local governments, First Nations, Not-for-profit organizations.
- For more details see link below https://www2.gov.bc.ca/gov/content/employment-business/economic-development/support-organizations-community-partners/rural-economic-development/rural-dividend

**Vancouver Foundation**

**Field of Interest Grant**

- Grants available for up to $300,000
- Next deadline July, 2018
- Applicable Field of Interest: Systems Change Grant.
  - Will support projects that take action to address the root causes of pressing issues by influencing the behaviours of populations, organizations, and institutions.
- For more details see link below https://www.vancouverfoundation.ca/grants/field-interest-grants

**GO Grants**

- Objective: getting classrooms outdoors
- GO Grant funding covers:
  - Transportation to field trip location: bus, train, boat, or mileage
  - Outdoor field trip equipment (eg drip nets, hand magnifiers etc.) or habitat stewardship project materials eg. Native plants, student gloves for planting
  - Outdoor fieldtrip leader, secondary school (gr. 9-12) T.O.C. costs and or program fees
  - Grants for an individual class and or requests of $600 or less
  - Grants for school-wide, district wide, or multiple classes greater than $600 to a max of $3500
- The key criteria for GO grants include trips or projects that are:
  - Conducted outdoors in a nature setting
  - Focused on learning about BC’s fish, wildlife habitats or biodiversity
  - Linked to curriculum
  - Hands-on or experiential for students
  - Planned with before and after learning extensions
- GO Grants is an online application process. Apply at https://hctfeducation.ca/go-grants/apply-for-grants/
- Applicants will be notified of their application status via email within 2 weeks of the deadline closing
Canadian Red Cross

Some of the long-term food security initiatives may be eligible for Red Cross wildfire recovery funding, depending on the details. Please see the website and email bccommunitypartners@redcross.ca to discuss any wildfire recovery or long-term food security project that you are wishing to carry out.
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**Fish Hatcheries**

**About Fish Hatcheries**

Fish hatcheries can be established for release into waterways, self-containment during early growth stages, or self-containment for an entire life cycle depending on the kind of food source chosen. A variety of fish are raised in hatcheries including salmon, trout, tilapia, and many others. Alternate aquaculture endeavours can include shellfish, such as mussels, oysters, etc. and crustaceans such as shrimp. Due to the scope of work and required knowledge, it is recommended that communities join together in these efforts, especially for salmon hatcheries as too many facilities on the same waterway can be counter-productive. Existing and successful hatcheries are the best source of information regarding the ins and outs of this kind of initiative.

“There are approximately 45 different species of finfish, shellfish and marine algae commercially cultivated in Canada. Aquaculture is practiced in every province and in the Yukon and takes place in marine environments, freshwater lakes and rivers, land-based ponds, or tanks. Production varies across the country depending upon the species being farmed, the environment within which it is farmed (marine or freshwater), the conditions on the ocean, lake or river floor (eg: sand or rock), and the culture technologies used (Figure 1).

Figure 1 shows how the scope of aquaculture operations vary across the country depending upon the species being farmed, the environment (marine or freshwater) and the culture technologies being used (land based, ocean or lake based). The main types of growing operations include: freshwater net pen and land-based systems; bottom culture shellfish operations in intertidal zones; long-lines, net pens and restocking operations in open water; and bottom culture shellfish grow-out areas in sub-tidal zones.

There are 26 different species of finfish cultivated in all regions of Canada. Finfish represents the largest component of the aquaculture sector. Salmon (Atlantic, Chinook and Coho) is the most significant finfish in terms of volumes produced and sold, although several species of trout and Arctic char are also produced.

Shellfish is an important part of the aquaculture sector on Canada’s East and West coasts with 16 different species cultured. Mussels and oysters are the most significant in terms of volumes produced and sold, but clams, scallops, and other species are also grown.

Marine algae farming is a small, yet growing sector in Canada, with many species of kelp, moss and seaweed cultivated in the Atlantic provinces.

The diversity of species in all sectors is expected to increase in the coming years.”


Figure 1: Types of Aquaculture
Benefits of Establishing Fish Hatcheries

**Health Benefits**
- Fish and shellfish can assist in supplementing the loss of protein traditionally gained from hunting practices that were disturbed in the 2017 wildfire season.
- Locally raised fish and shellfish create transparency in terms of knowing what, if any, genetic modification/chemicals/growth hormones are involved with the production of your food.

**Education and Employment Opportunities**
- To train interested community members including all ages and genders.
- To provide youth education opportunities to learn about aquaculture including information on cultural significance of fish, specifically salmon, migration routes, different breeds of salmon and fresh water fish, the lifecycle of a fish and shellfish, operational tasks in an aquaculture facility, etc. Could have students volunteer to ease labour requirements during busy months. See Potential Grant Opportunities for Fish Hatcheries for information on potential k-12 GO Grants.
- To potentially partner with expert organizations such as the Pacific Salmon Foundation or Marine Harvest for training and educational workshops.
- To implement an interpretive centre for students and public.
- To apply for DFO’s Stream to Sea’s classroom incubation period program where classrooms K-12 can receive an aquarium and salmonid eggs to raise until they are mature enough to release into a local creek. DFO Education Resources: [http://www.pac.dfo-mpo.gc.ca/education/resources-ressources-eng.html](http://www.pac.dfo-mpo.gc.ca/education/resources-ressources-eng.html)
- To employ community members for day-to-day operations, or if the project expands to a large-scale operation.

**Opportunity for Growth**
- To adapt the size of an aquaponics facility to support a single community, or multiple communities depending on interest.
- To increase the opportunity to involve multiple communities.
- To provide fresh fish and shellfish to restaurants seeking local/regionally traditional foods.

**Environmental Benefits**
- Reduces the ‘Food Miles’ or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.
- Increases fish and shellfish nitrogen in forests. This is an integral part in reforestation of Douglas fir, Sitka spruce, Western Red Cedars, etc. and is particularly important for forest re-establishment after the wildfire season of 2017.
- May increase fish stock in local lakes or oceans which, in response to declining fish populations in local lakes or in the Fraser River and Chilcotin River, can
minimize short-term extinction risks for endangered populations by maintaining population levels at a safe level until factors for decline can be addressed.

**Increasing Food Security**
- Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.
- In response to climate change, fish and shellfish stocks are diminishing however the demand for fish has not. Stocking the local lakes and oceans may increase the number of harvestable fish that return at the end of their migration cycle.

**Traditional Indigenous Knowledge Sharing Opportunity**
- Opportunity for elders to pass down traditional knowledge to youth regarding salmon and other fish or shellfish species growing/harvesting seasons as well as their migration routes, etc.
Assessing Needs and Determining Goals

Explore Partnering Opportunities with Neighbouring Communities
• Suggest working together with many First Nations communities living along the same water source/watershed to establish a singular, successful hatchery.

Consultations/Training
• Determine how your community is going to obtain education/training
  o Industry experts, local traditional knowledge, develop partnership with expert in field, online resources
• Need to have people trained for the following duties:
  o Manager, divers, boat operators, net tenders, data keepers, daily operations

Scale Considerations and Additional Assessments
• Determine scale:
  o Small: Feeds singular community
  o Medium: Feeds multiple communities in one region
  o Large: Commercial Operation- distribute to stores, restaurants, many communities
• Assess the number of people that need to be fed
• Decide what your production goals are. What species of fish do you want, and that is allowable, to stock the ocean/river/lake/pond with? Is there a need to replenish other food sources as well at the same time (i.e. kelp forests and crustaceans)?

Location Considerations
• Regional/Seasonal Climate
• Animals/Predators/Pests
  o Be aware that operating an establishment such as this could potentially attract wildlife such as bears, wolves, cougars, and birds into populated areas. This could be potentially hazardous to residents of the area, but can also benefit the wilderness when these predators drag out fish carcasses and drop them in the forests, increasing the amount of available nitrogen for the forests to absorb.
• Is your community located near the ocean, a river, a lake, a pond, or landlocked?
• What is the composition of the ocean/lake/river/pond floor (sand or rock)?
  o Will decide what technologies/techniques are appropriate for landscape
• How has the ocean/river/lake/pond in consideration been affected by climate change in the past? What trends are predicted for the future?
  o May need to consider a more resilient breed that can adapt to warmer waters
• Which species already exist in the ocean/river/lake/pond under consideration?
• Consider if there are already any other competing fish hatchery operations along the water source. Do other hatcheries have the capacity/interest in partnering with your community to expand their operations?
• Would introducing a large amount of one singular breed throw off the existing ecosystem balance?
  o Is it necessary to replenish the kelp forests, crustaceans, different fish breeds, and other marine life to maintain a balance in the river?
  o Consult with a DFO expert for a site assessment
• What square footage does the community have access to?
  o For the physical structure required for storing incubation aquariums
  o Large holding tanks
  o Storage of materials/equipment
• What access to water/power does your community have?
• What availability do you have to access materials from your own community/surrounding communities?

Create a Design Plan
• Decide if your community wants to release the fingerlings for the fish to mature in the ocean/lake/pond or if you are going to raise them in holding tanks for their entire lifecycle.
• Decide size of establishment to be implemented and the number of communities to be involved
• Decide building structure
  o Scale dependant
  o Climate dependant
  o Ensure it will keep predators out
  o Storage capacity for required materials
  o Heating/cooling requirements, ventilation, air quality
- Decide on a harvesting technique available to your community
  - Freshwater Net Pen
  - Land-based Systems
  - Bottom Culture/Enhancement-Intertidal
  - Long-line/Raft
  - Bottom Culture/Enhancement-Subtidal
  - Net Pen
  - Culture-Based Fisheries
- Decide what is possible to harvest with the techniques available
  - Finfish e.g. Salmon (Atlantic, Chinook and Coho), Trout, Arctic Char
  - Shellfish e.g. mussels and oysters, clams, scallops, etc.
  - Marine Algae Farming e.g. kelp, moss, seaweed
- Decide whether your community wants to maintain their broodstock in captivity or to do a wild catch every fall
  - Benefits of keeping stock in captivity:
    - Can chose the largest/strongest fish to reproduce for greater chance at survival and perhaps larger return
  - Risks of keeping stock in captivity:
    - Can display consanguineous problems due to lack of diversity
  - Benefits of wild catch:
    - Increased genetic diversity
  - Risks of wild catch:
    - Subject to environmental conditions and climate change and can be unreliable
- Decide how to manage waste
  - Disposal of mortalities in a way that they do not attract wildlife to rural areas
- Decide on cold storage options
  - For fish
  - Depending on scale/distribution purposes is a refrigerated truck required?
Preparation

Obtain Permits, Insurance, Liabilities and Create Emergency Plans and Protocols

- Find a local veterinarian
- Consider business continuity insurance
- Consider insurance for buildings/structures
- Plan and protocol development can include:
  - Fish health plan, mass depopulation plan, pest control plan, emergency evacuation plans, disease prevention, sanitation protocol etc.
- Obtain appropriate fishing license:
  - For more information on B.C.’s existing stocked rivers and lakes see link below
    https://www.gofishbc.com/Where-to-Fish.aspx
  - For more information on Pacific Region Fishing Licences (Recreational Fishing, Commercial Fishing, Aboriginal Communal Licences, Aquaculture, Scientific and Special Purpose) see link below
  - Note: First Nations are exempted from the application of the Wildlife Act 1982 (Canada) of existing Aboriginal and treaty rights. This means that they do not need to be licenced or hold any permits for angling in the non-tidal waters of B.C. For more information on Aboriginal harvesting rights see link below
- For permits, licences, regulations surrounding starting your own hatchery facility see information below

Acquiring a Pacific Freshwater/Land-Based Aquaculture Licence for a Hatchery Facility

Under the Pacific Aquaculture Regulations (PAR), if you intend to culture fish in British Columbia, you must apply to FrontCounter BC for an aquaculture licence. Below is relevant information and web links on acquiring a Pacific Freshwater/Land-Based Aquaculture Licence. The best first step is to become familiar with Regulations, BC Introductions and Transfers website, the Conditions of Licence for Freshwater/Land-based facilities in BC, and other helpful sites prior to applying.

1. Review the “Pacific Aquaculture Regulations” which are the overarching regulations that govern aquaculture management in British Columbia

2. Read through the “Freshwater Conditions of Licence”
3. Familiarize yourself with the BC Introductions and Transfer Committee (ITC) as they would need to approve any movements of fish around BC (including any movement into the proposed facility). They may also have specific requirements for the facility to minimize escapes.

You may want to contact the ITC directly to confirm any extra concerns they may have regarding movement of any non-indigenous fish. Please contact the ITC if you have any additional questions regarding their process or their application form at: ITC@dfo-mpo.gc.ca.

Lastly, the actual application for a Pacific Freshwater/Land-based aquaculture licence is located on the Provincial website (approximately half way down the front page). See the provided links for the main page, as it is very helpful. There is also a freshwater and land based aquaculture application guide, which has more information included.

To apply for an aquaculture licence is free. If your aquaculture licence application is approved, there is a $104 fee to issue a licence. Currently, all new licences issued will be in effect until June 2024.

**Premises Identification**

Premises Identification links livestock and poultry to geographic locations and is an important part of a full traceability system that also includes animal identification and animal movement.

If you raise livestock or poultry, or they are transported to and from your parcel of land, a Premises ID is an important step in protecting the health and safety of your animals and those of other British Columbia and Canadian producers.

B.C. livestock and poultry owners are invited to provide basic land and contact information for their premises by completing a Premises Identification Registration Form and submitting it to the Ministry of Agriculture. There is no cost to participate in the program. Information collected will assist both industry and government in the planning and management of animal disease outbreaks or other emergencies threatening animal or human health.

**Premises Identification Link**

https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/premises-id?keyword=Premises&keyword=ID&keyword=program
Required Materials
The list below includes materials that can be required for all aquaculture operations. Due to the large number of unique variables to be considered in this project (access to rivers, lakes, and ocean, population of community, techniques and practices used, what species are to be harvested, pre-existing structures and establishments etc.) this list is by no means exhaustive and requires adaptations and additions upon consultation with experts in the field to suit the needs of the individual operation.

- Personal protective equipment
  - Gloves, hats, boots, waders
- Fish barrier, seine net, trammel net, monofilament net etc.
  - Note: Fish barriers and seine fishing are preferred methods
- Incubation aquariums
  - Maintenance materials
  - Aquarium stands
  - Water filters
  - Heating and lighting supplies
  - Water conditioners
  - Thermometer
  - Airstone/airline/air pumps
- Fish feed
- Buckets
- Egg shocking trays and bowls
- Temporary holding tanks
  - For sorting in the river if necessary for chosen operation
  - For temporary holding at the establishment
- Tanker truck and transport containers
  - Containers to be round in shape or square with rounded corners to avoid skin abrasions
- Cold storage options
  - Depending on scale (could be one household refrigerator or multiple. Other options available such as installing a refrigeration unit for commercial operations)
  - Depending on scale is a refrigerated truck required for distribution?
- Compost system
  - Compost of mortalities
Implementation

**Acquire Building Materials**
- Obtain materials above as well as materials required to build your hatchery facility structure from your local hardware store.

**Installation of Structure**
- Structure must be able to
  - Meet regional by-law requirements
  - Keep out animals and predators
  - Maintain adequate temperature regulation
  - Space for storage of materials
  - Space for incubation tanks
  - Space for tanks for fry and fingerlings

**Acquire Stocks**
- Decide whether to do annual wild catch or to contact a broodstock facility
Lifecycle

Collect Broodstock
If obtaining broodstock from a broodstock facility consider that introductions and transfers of finfish are easier if they are already a pre-approved establishment with the DFO. Depending on scale, and if you are establishing your hatchery around a river, lake, or pond, different approaches, technologies and adaptations will have to be researched and implemented for the most efficient way to collect wild broodstock.
Below is an example of the steps to consider when harvesting salmon broodstock from a river.

- Organize materials such as nets, trucks, and holding tanks as well as volunteers.
- Divide tasks to work parties including divers, boat operators, net tenders, and data keepers.
- Spread the net out on the beach to ensure that there are no tangles in the cork line (top line with floats) and lead line (weighted bottom line) or holes in the mesh.
- Have divers enter the water at the same time as the skiff operator tows the cork line of the net out into the upper side of the pool in the river. Have divers spook the fish away from the lead line of the net and get the line over snags.
- Drag another net across the tailout of the selected pool at the same time to ensure that the fish do not escape.
- Once the upper net has spanned the pool, have the seining team drag their net down river from either side to the tailout of the pool. When the two parties on either ends of the upper and lower nets meet, the cork line and lead line are closed.
- Close the lead line on the bottom underneath so that the fish cannot escape.
- Sort through fish by species, releasing the species that are not desired and holding the desired species in holding tanks in the river.
- Fill the tanker truck and transport fish to the hatchery. Unload fish into their appropriate holding tanks.

Fertilize Eggs
- Determine if the fish captured are ripe enough for spawning or if they need to be held for a while to ripen. Being ripe for spawning is determined by rubbing a firm hand on the belly of the fish and pressing down toward the anal fin. The fish will be determined ripe if eggs come out of a female or if milt (sperm) comes out of the male. Ripe fish are put aside for immediate egg or milt collection.
- After all fish have been unloaded, stun the ripe females and slit open to remove their eggs. Weigh the mass of eggs take a small sub sample (50grams) and count to estimate the total egg yield.
- Record the number of eggs per female, and then choose a few males to be sperm donors. Consider including Jacks (young males) as donors to the
selection that occurs in natural spawning. Blend the milt with the eggs to fertilize them and distribute eggs into trays and place them in the incubator room.

- There are a number of ways to dispose of fish once they have been spawned. Research what method works best for your community. Some examples include composting the carcasses, donating to wildlife recovery centres to feed their animals, or use in traditional and cultural practices.

**Incubate Eggs**

- After 2 weeks, pour the eggs in trays from a height of 12”-14” and then continue pouring the eggs from one bucket two or three more times. The purpose of this step is to burst any unfertilized egg yolks.

- After a further incubation of one week, pour the shocked eggs into bowls and remove and count any cloudy eggs (burst yolks). If an unfertilized egg is left sitting in the tray it will soon be colonized by fungi and bacteria. Such eggs are a hazard to nearby healthy eggs. A whole tray of eggs may be lost if the bad ones are not removed. Have volunteers count removed unfertilized eggs and recalculate the numbers of healthy eggs remaining.

- At this point the eggs should be at the stage where you can see the eye of the fry developing inside the egg. Continue the cycle of checking trays for bad eggs every week throughout the eyeing stage until the next phase which is the alevin stage.

- The alevin stage is when the hatchlings are swimming and breathing in the trays but still have their yolk sack attached. From this point they consume their yolk and become fry. Have volunteers move the fry into holding tanks and feed them over a period of months until they reach a weight of at least two grams. Once fry reach this weight they are then ready to be released.

**Release Fry**

- The number of weeks for fry to reach a mature enough state to be released depends on the species of fish and the environment they are being released into. Further consultation is required.

- If releasing fry into a river, the return period depends on the species of fish and their unique migration routes. The return period can take anywhere between 2-6 years before fish return to the same area to spawn.

- If releasing fry into a lake you can easily monitor the development and maturation of the stocks and have a more immediate return.

**Repeat Cycle Annually**

- In order to get continuous return, the lifecycle steps above need to be repeated annually.
End of Lifecycle

Harvesting of Fish
- Refer to the Obtain Permits, Insurance, Liabilities and Create Emergency Plans and Protocols section to ensure you have obtained the proper licence and are following the appropriate regulations as stated by the DFO.
- Oceans, rivers, lakes, or ponds all have varying harvesting techniques depending on scale and harvesting goals.

Processing of Fish
- Fish, seafood, and aquatic plant processors require a seafood processor licence. Commercial fishers selling their catch to the general public directly from their harvest vessel, or to restaurants or retail stores, require a fisher vendor licence.
- For more information on seafood industry licensing see link below https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/fisheries-and-aquaculture/seafood-industry-licensing

Distribution
- Are you going to sell to restaurants/markets/stores or distribute to immediate community? (not for sale purposes)
- If distributing for profit, ensure that the appropriate permits and licences have been obtained
- Identify if it is necessary to obtain a licence through the Canadian Food Inspection Agency.
Budget Considerations
When creating your budget consider the following in regards to the scale of choice if required:

- Permits/Insurance costs
- Consultant fees
- Land preparation
- Materials (see list above)
- Structure cost
- Water costs (for incubators)
- Heating/cooling costs of water (dependant on breed of fish)
- Replace/repair costs of materials
- Annual maintenance
- Staffing costs (if operating on medium to large scale)

Suggested Contacts
If developing your hatchery on a medium or large scale, contact the experts below in your region.

- Department of Fisheries and Oceans (DFO)
- First Nations Fisheries Council of B.C.
- Regional by-law officers
- Local hardware stores
- Broodstock facilities
- Grant writers

Resources
For general DFO fishery regulations see link below

For more information regarding establishing a fishery on First Nations land consult the First Nations Fisheries Council of B.C.:

First Nations Fisheries Council of British Columbia
320-1200 West 73 Ave, Vancouver BC, V6P 6G5
Tel: 778-379-6470, Fax: 778-379-6469
Email: info@fnfisheriescouncil.ca
Website: http://www.fnfisheriescouncil.ca/
For information regarding aquaculture licenses, including the licencing of enhancement facilities contact the Department of Fisheries and Oceans (DFO):
   Email: aquaculture.licensing@dfo-mpo.gc.ca

For information regarding fresh-water/land-based aquaculture licenses, contact the Department of Fisheries and Oceans (DFO):
   Email: Freshwater.Aquaculture@dfo-mpo.gc.ca
Potential Grant Opportunities for Fish Hatcheries
Note: These grants are subject to change

Pacific Salmon Foundation
Community Salmon Program
- Annual intakes every February
- 2 streams of grant funding: Short and Standard Form applications. Applicants are limited to one Short Form application (single-item requests not exceeding $1,500) per funding round, and unlimited Standard Forms (requests over $1,500).
- Please note that CSP will pay up to 50% of the total value of each project and must be matched by other funds, donations, and volunteer labour.
- The Pacific Salmon Foundation’s Community Salmon Program is a grant making program that supports volunteer and community–driven organizations that undertake salmon conservation and restoration projects in British Columbia and the Yukon. The program makes annual grants totaling more than $1.5 million. The majority of these funds are generated through sales of the Recreational Fisheries Conservation Stamp, commonly known as the Salmon Stamp, by Fisheries and Oceans Canada.
- Contact the Salmon Programs staff to learn more about applying for the Community Salmon Program: jshinkewski@psf.ca or 604-664-7664 x112
- For more information see:
  https://www.psf.ca/what-we-do/community-salmon-program

Pacific Salmon Foundation
Partnered Initiatives
- The Pacific Salmon Foundation grants organizations that undertake Pacific salmon conservation and restoration or science and research. Occasionally, the Foundation will spearhead and execute a specific project of larger-scale. These projects must be strategically-critical projects that would otherwise not be undertaken without the Foundation’s involvement.
- The Foundation partners with government agencies, other non-profits, businesses and volunteers to make Partnered Initiatives successful.
- Contact our Salmon Programs staff to learn more about applying for a Partnered Initiative: salmon@psf.ca
- For more information see link below
  https://www.psf.ca/what-we-do/partnered-initiatives
**Marine Harvest Canada (MHC)**

*Salmon Enhancement Programs*
- Currently operates within the traditional territories of 24 Canadian First Nations
- Potential partnership opportunity
- May apply for a cash or an in kind donation (used equipment)
- For more information see link below
  
  http://marineharvest.ca/people/supporting-the-community/

**Aboriginal Fund for Species at Risk (AFSAR)**
- Supports the development of Indigenous capacity to participate actively in the implementation of the Species at Risk Act.
- AFSAR supports projects that will proactively prevent species, other than species at risk, from becoming a conservation concern.
- The AFSAR program allocates approximately $3 million/year to projects on Indigenous lands and waters.
- For more information see link below
  

**Aboriginal Fisheries Strategy (AFS)**
- Objectives:
  - To provide a framework for the management of fishing by Aboriginal groups for food, social, and ceremonial purposes
  - To provide Aboriginal groups with an opportunity to participate in the management of fisheries, thereby improving conservation, management and enhancement of the resource
  - To contribute to the economic self-sufficiency of Aboriginal communities
  - To provide a foundation for the development of self-government agreements and treaties
  - To improve the fisheries management skills and capacity of Aboriginal groups
- Annual funding of the AFS is $35 million with about 125 AFS agreements signed each year
- About 3/5 of the above agreements reached were with Aboriginal groups in DFO’s Pacific Region
- For more information see link below
  

**Aboriginal Aquatic Resource and Oceans Management Program (AAROM)**
- Provides funding to qualifying Aboriginal groups to establish aquatic resource and oceans management bodies
- Goal of AAROM is to help Aboriginal groups to participate effectively in advisory and decision making processes used for aquatic resource and oceans management
- Eligibility:
  - To qualify for support, Aboriginal communities are required to work together in relation to a watershed or ecosystem and meet certain requirements related to management practice.
  - The AAROM program employs a community-driven approach that recognizes that different groups are at different stages of capacity development and don't have all the same priorities and goals.
  - For eligible groups, funding may also be available to obtain access to commercial fishery opportunities (including vessels and gear) and to build the capacity of groups to take advantage of aquaculture opportunities. In addition, qualifying groups may be eligible for funding for the development of Aboriginal Fishery officers.
  - Program will only be available to groups that are located where the DFO manages the fishery, and that have not signed a comprehensive land claims agreement that addresses the matters under AAROM.

- For more information see link below:

**Pacific Integrated Commercial Fisheries Initiative (PICFI)**
- Program designed to increase First Nation access to the commercial fisheries in B.C., develop common and transparent rules that apply to all participants, and improve the management of the commercial fisheries through greater collaboration amongst stakeholders.

- Objectives:
  - Improve the business and operational capacities required by Aboriginal Commercial Fisheries Enterprises (CFE’s) in B.C. to successfully manage sustainable commercial fisheries.
  - Improve collaboration within and between commercial fishing fleets and DFO, while engaging and the multi-sector level in the management and promotion of sustainable integrated fisheries.
  - Increase compliance with regulations and management controls in all fisheries and improve accountability in fisheries info and decision making.

- For more information see link below:
Allocation Transfer Program (ATP)

- Under the AFS, ATP can provide commercial fisheries access (which may include licenses, quota, vessels, and gear) to eligible FN groups under the terms of an annually negotiated AFS comprehensive fisheries agreement
- Eligibility:
  - FN seeking access to communal commercial fishing licenses under the ATP must have a current AFS comprehensive fisheries agreement with DFO, a satisfactory record of compliance with conservation and fisheries management practices, and satisfactory compliance with the terms of their AFS agreement
  - Communal commercial licenses are issued under comprehensive fisheries agreements, which are negotiated annually by AFS resource management staff in DFO’s area offices, as a part of the AFS. First Nations can contact the Resource manager in their geographic area for more information on AFS agreements
- For more information see link below

GO Grants

- Objective: getting classrooms outdoors
- GO Grant funding covers:
  - Transportation to field trip location: bus, train, boat, or mileage
  - Outdoor field trip equipment (e.g. drip nets, hand magnifiers etc.) or habitat stewardship project materials e.g. Native plants, student gloves for planting
  - Outdoor fieldtrip leader, secondary school (gr. 9-12) T.O.C. costs and or program fees
  - Grants for an individual class and or requests of $600 or less
  - Grants for school-wide, district wide, or multiple classes greater than $600 to a max of $3500
- The key criteria for GO grants include trips or projects that are:
  - Conducted outdoors in a nature setting
  - Focused on learning about BC’s fish, wildlife habitats or biodiversity
  - Linked to curriculum
  - Hands-on or experiential for students
  - Planned with before and after learning extensions
- GO Grants is an online application process. Apply at https://hctfeducation.ca/go-grants/apply-for-grants/
- Applicants will be notified of their application status via email within 2 weeks of the deadline closing
Canadian Red Cross

Some of the long-term food security initiatives may be eligible for Red Cross wildfire recovery funding, depending on the details. Please see the website and email bccommunitypartners@redcross.ca to discuss any wildfire recovery or long-term food security project that you are wishing to carry out.
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Poultry Farming

About Poultry Farming

Poultry farming refers to raising animals such as chickens, turkeys, ducks, or geese. Specifically, they can be raised for either eggs or for meat. Poultry farming can also present an opportunity for creating food cycles, with the poultry providing fertilizer for vegetable gardens, and the vegetable scraps being provided as feed for the poultry. Poultry farming is a complex operation and should not be taken on without extensive research and communication with experts. It is recommended to consult the BC Small Flock Poultry Health Manual that outlines housing and management, basics and disease, biosecurity, and suggested resources before initiating any poultry project. [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/animal-production/small_flock_manual.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/animal-production/small_flock_manual.pdf)

It is important to understand that the information included below is by no means complete as it was designed to simplify a complex cycle with many different variables. As with the rest of the package, the considerations below are merely meant to assist with the brainstorming process. The information is not a technical step-by-step how-to manual; it will therefore require further research depending on the practice that you or your community is pursuing.

Benefits of Poultry Farming

Health Benefits

- Eggs and meat can provide multiple sources of protein to assist in supplementing the loss of protein traditionally gained from hunting practices that were disturbed following the 2017 wildfires.
- Increased transparency when poultry is raised locally in terms of what antibiotics/hormones/feed/quality of life/potential diseases it has been exposed to.
- Decreased risk of disease in small scale production. If disease were to occur it would be quickly detected and response rate should be very fast.

Education and employment opportunities

- To train interested community members including all ages and genders.
- To implement school programs for older students. Educate youth on practical skills including hatching and raising chicks, alternative protein sources that are not traditional hunting, what goes into constructing a coop and the daily chores required for either laying or broiler chickens. Eggs or meat could be used if there is a Home Economics program offered at the school. If not eggs could be sold and profits could go towards materials for repair, maintenance, feed and bedding for the project.
- To employ members of the community if operating on medium to large scale.
- See Resources for information on Tsawwassen Farm School for potential training/education opportunities.
Opportunity for Growth
- To adapt the size of the project from small scale back yard family projects, to medium scale community projects, to large scale commercial operations.
- To increase the opportunity to sell, trade, or share products between multiple communities.
- To distribute meat/eggs to restaurants if between medium and large scale.

Environmental Benefits
- Reduces the ‘Food Miles’ or the distance your food has to travel before reaching your plate; therefore, reducing your carbon footprint and overall contributions to climate change.

Increasing Food Security
- Community may become less reliant on outside suppliers for food. If a community is isolated due to an emergency or road closure, a community could be more self-reliant in the short term.

Examples of Poultry Farming

Source: https://www.flickr.com/photos/23157748@N07/6060205350

Source: https://commons.wikimedia.org/wiki/File:Chicken_coop_-_Tinsley_Living_Farm_-_Museum_of_the_Rockies_-_2013-07-08.jpg
Assessing Needs and Determining Goals

Consultations/Training
- Determine how your community is going to obtain education/training
  - Industry experts, local knowledge, online resources
  - See Resources for information on Tsawwassen Farm School for potential training/education opportunities

Scale Considerations and Additional Assessments
- Determine scale:
  - Small: Feeds an individual family
  - Medium: Feeds community
  - Large: Commercial Operation- distribute to stores, restaurants, multiple communities
- Assess the number of people that need to be fed. Suggest starting small to feed individual homes or a single community and expanding from there if project is successful
- Do you want to work with other communities? Options are to have one household/community do chickens and have one do turkeys, or have one household/community do layers and one do broilers
- Decide what your production goals are. Do you want chickens or turkeys? Layers or broilers? Which breed(s)? How many?
- Decide whether you want to establish a hatchery on site or outsource your chicks
- If broiler, decide whether you want to on site slaughtering, find access to a mobile abattoir, or go to a slaughter establishment near your community
Location Considerations
- Regional/Seasonal Climate
- Animals/Predators/Pests
- What square footage do you have access to?
  - Commodity-specific organizations have information about specific housing systems. Poultry housing, handling and care requirements in B.C. are set by the respective marketing boards (see Federal/Provincial Industry Links under resources), and minimum standards are set by the National Farm Animal Care Council. All supply-managed producers are subject to regular audits of their on-farm animal welfare standards, biosecurity and food safety programs.
  - General info on siting and management of poultry barns can be found here: Strengthening Farming Factsheet
- What availability do you have to access feed, straw and sawdust from your own community-surrounding communities?

Create a Design Plan
- Decide size of flock to be introduced
- Decide building structure: Coop or Barn?
  - Scale dependant
  - Climate dependant
  - Heating/cooling requirements, ventilation, air quality, how much square footage required/number of birds, scratch patches, how much sawdust, straw required/structure, how to keep out predators. For more information on minimum requirements see section 3 of: http://www.nfacc.ca/poultry-code-of-practice
- Decide how you are going to manage waste
  - Compost of straw/sawdust/chicken waste (manure)
  - Disposal of mortalities
- Decide on cold storage options
  - For meat/eggs
  - Depending on scale/distribution purposes is a refrigerated truck required?
Preparation

Obtain Permits, Insurance, Liabilities and Create Emergency Plans and Protocols

- Find a local veterinarian
- Consider business continuity insurance
- Consider insurance for buildings/structures
- Plan and protocol development can include:
  - Flock health plan, mass depopulation plan, pest control plan, emergency evacuation plans, disease prevention, biosecurity protocol, sanitation protocol etc.
- For detailed information regarding plans and protocols see section 5 of http://www.nfacc.ca/poultry-code-of-practice
- Depending on the number of poultry desired, permits may be required through the respective marketing board (see Federal/Provincial Industry Links under resources)
  - Can have up to 99 egg laying birds or 200 broiler birds for personal consumption/year with no permits
  - Can have up to 400 layers or 2000 broilers per year with a marketing board permit ($20 annual fee)
  - Anything larger must go through the appropriate marketing board and will depend on region
- Obtain appropriate slaughtering licence if required
  Link to Provincial Slaughter Regulations: https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/meat-inspection-licensing
- If more than 400 eggs are produced daily, egg grading is required.
- Must adhere to the Canadian Food Inspection Agency Regulations http://www.inspection.gc.ca/about-the-cfia/acts-and-regulations/eng/1299846777345/1299847442232
Premises Identification
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Premises Identification Link
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/premises-id?keyword=Premises&keyword=ID&keyword=program
Required Materials

- Chicken wire/fencing
- Personal protective equipment
  - Gloves, hair nets, disposable sleeves, boots, coveralls
- Watering system
  - Pan and jar type
  - Water basin made of plastic/wood/GI with grill
  - Bell type automatic waterer
  - Nipple drinker
  - Manual drinker
- Feeding system
  - Linear feeder
  - Circular feeder
  - Shell grit box
  - Automatic feeder
- Poultry Feed
- Heaters or brooders
  - Charcoal stove
  - Kerosene stove
  - Gas brooder
  - Infra-red bulbs
  - Reflectors (hovers)
- Incubator (if initiating a hatchery)
  - Incubator controller (for temp and humidity condition)
- Chick box (for egg laying. Has roll away egg tray attached to protect eggs from being damaged)
- Fly tray (to control the amount of flies in the coop/poultry farm)
- Ventilation Fan
- Egg scale
- Egg washer and egg washing powder
- Dressing machine (broilers only and on site slaughter only)
- Spade shovel(s)/flat shovel(s)
- Wheel barrow(s)
- Cold storage options:
  - Depending on scale (could be one household refrigerator or multiple. Other options available such as installing a refrigeration unit for commercial operations)
  - Depending on scale is a refrigerated truck required?
- Compost system
  - Compost of straw/sawdust/chicken waste (manure)/mortalities
Implementation

Acquire Materials
- Obtain materials above as well as materials required to build your structure (coop or barn) from your local hardware store.
- Locate a local hatchery or chick broker in preparation to populate your coop/barn once completed, or to obtain fertilized eggs for your hatchery if you chose to implement one on site.

Installation
- Build structure that meets code requirements developed by respective marketing boards (see Federal/Provincial Industry Links under resources for individual marketing boards) as well as regional by-laws.

Introduce Poultry
- When introducing poultry to a new coop or barn for the first time consider the following:
  - Keep them in the coop for a few days so that they can learn that the coop is their new home
  - After a few days, introduce the poultry to their run and let them explore
  - For the first few weeks make sure that the poultry are entering their coop at night on their own and if they don’t, pick them up and put them in the coop
- When introducing new poultry to an already established flock consider the following:
  - Quarantine the new poultry for a couple of weeks to avoid risking the spread of disease to the existing flock
  - Introduce poultry that is a similar size as the existing flock. If flock is all one breed/colour, it is best to only introduce poultry of the same breed/colour. However, if the existing flock is already of mixed breeds and colours, it is easier to introduce a new breed
  - Provide ample amounts of space to avoid overcrowding. Do not introduce poultry into a coop/barn that is close to capacity
  - Introduce poultry to the coop in a smaller, enclosed pen so that other poultry can observe them without the ability to harm them
  - Introduce poultry at night so that the flock can all wake up together
  - Distract the existing flock by hanging items from the ceiling of the coop/run
  - Ensure that there is access to lots of food and water so that the existing flock does not feel the need to protect what is already there
  - Remove injured poultry, especially if blood is drawn so that other poultry do not harm the injured bird
Lifecycle

Daily Requirements
- Food inspections 2x’s daily
- Mortalities and culls must be recorded daily
- Cases involved in unexpected illness, death, or increases in mortality rates must be investigated
- Dead birds must be removed and disposed of daily
- Feeding
- Provide fresh water
- Cleaning coop/barn
- Collecting eggs
- Letting poultry inside and outside at the appropriate times
- Observe poultry to ensure none are injured

Seasonal/Annual Tasks
- Replace/freshen bedding monthly
- Freshen nest boxes monthly
- Clean and sanitize waterers monthly or bi-weekly
- Clean and sanitize coop annually or semi-annually
- Safety checks for the structure (ongoing)

Stock Replenishment
- Contact your local hatchery or chick broker in preparation to repopulate your coop/barn once stocks have depleted, or obtain fertilized eggs if you chose to implement a hatchery on site
End of Lifecycle

Processing of Poultry

- Scale dependant: what will be done on site, off site? Options are:
  - On-site slaughtering
  - Contact a mobile abattoir
  - Visit a licenced slaughter establishment near your community
- Some companies provide food processing services such as packaging and labelling, if chosen to do this step independently, consult the Government of Canada's Consumer Packaging and Labelling act (link below):

Distribution

- Are you going to sell to restaurants/markets/stores or distribute to immediate community? (not for sale purposes)
- If distributing for profit, ensure that the appropriate permits and licences have been obtained
- Identify if it is necessary to obtain a licence through the Canadian Food Inspection Agency.
Suggested Contacts
If developing your poultry farm on a medium or large scale, contact the experts below in your region.

- Regional by-law officers
- Veterinarians
- Poultry hatcheries/poultry brokers
- Poultry farming experts
- Local hardware store
- Feed companies

Resources
For contacts for the following establishments/services in B.C. see the BC Poultry Services Guide link below

Contact information for
- Hatcheries
- Chick brokers
- Processers
- Feed companies
- Equipment and supplies
- Cleanout and disinfection
- Bedding supplies
- Vets
- Water sampling
- Additional contacts


Tsawwassen Farm School
- The Tsawwassen Farm School (TFS) is a collaboration between the Tsawwassen First Nations and the Institute for Sustainable Food Systems (ISFS) at Kwantlen Polytechnic University (KPU)
- The school fuses sustainable agriculture and traditional indigenous food systems as tools to build community and create dialogue around land stewardship for the future
- The program is a combination of in-class learning and experiential practicum time
- The core learning components are:
  - Market crop production
  - Soils, water, and compost management
  - Integrated pest management
  - Farm animals-poultry, pigs, ducks
  - Apiculture-beekeeping
  - Fruit tree production
For more information see:  
http://www.kpu.ca/tfnfarm

**Code of Practice Links**
For National Farm Animal Care Council (NFACC) codes of practice for chickens, turkeys, and breeders see link below

For NFACC codes of practice for pullets and laying hens see link below

For information on poultry farming including animal husbandry, farm buildings, and waste handling see link below

**Federal/Provincial Industry Links**

<table>
<thead>
<tr>
<th>Canadian Organizations</th>
<th>BC Organizations</th>
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<tbody>
<tr>
<td><strong>Chicken Farmers of Canada</strong></td>
<td><strong>B.C. Chicken Marketing Board</strong></td>
</tr>
<tr>
<td><a href="https://www.chicken.ca/">https://www.chicken.ca/</a></td>
<td><a href="http://bcchicken.ca/">http://bcchicken.ca/</a></td>
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<tr>
<td><strong>Canadian Hatching Egg Producers</strong></td>
<td><strong>B.C. Broiler Hatching Egg Commission</strong></td>
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<tr>
<td><strong>Egg Farmers of Canada</strong></td>
<td><strong>B.C. Turkey Growers Association</strong></td>
</tr>
<tr>
<td><strong>Turkey Farmers of Canada</strong></td>
<td><strong>B.C. Poultry Association</strong></td>
</tr>
<tr>
<td><a href="https://www.turkeyfarmersofcanada.ca/">https://www.turkeyfarmersofcanada.ca/</a></td>
<td><a href="http://bcac.ca/">http://bcac.ca/</a></td>
</tr>
</tbody>
</table>

**Slaughter Establishment Resources**
Slaughter establishments in B.C. are either federally registered by the Canadian Food Inspection Agency or are provincially licensed. Slaughter establishments that are provincially licensed are only permitted to sell their product within B.C. Federally registered establishments are permitted to export their product outside the province.¹

¹ [https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/meat-inspection-licensing](https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/meat-inspection-licensing)
Link to Provincial Slaughter Regulations:
https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/food-safety/meat-inspection-licensing

Printable list of licensed slaughter establishments (PDF)
See: APPENDIX 6: Provincially Licensed Class A and B Meat Plants Pursuant to the BC Meat Inspection Regulations as of 20-Mar-18

Printable list of licensed slaughter establishments by region

Link to Federally Licensed Slaughter Establishments:

For questions about slaughter establishments or meat inspection contact:
Tel: (250)356-8944
Email: bcmeatinspection@gov.bc.ca
Potential Grant Opportunities for Poultry Farming
Note: These grants may be subject to change.

**Poultry Biosecurity Program**
- Funding available for projects that address the following key activity areas identified in the Poultry Industry Biosecurity/Emergency Response Strategic Plan:
  - Implement enhanced biosecurity protocols
  - Develop an emergency response management plan that links to the provincial FADES plan
  - Develop an effective and comprehensive risk management program
- Each project idea is carefully evaluated to determine:
  - How well it meets the goals and objectives outlined in the poultry industry biosecurity/emergency initiative security plan
  - How well it meets IAF’s funding principles
  - The level of support from other groups or agencies
- Applications can be submitted at any time
  - Contact the project manager to find out more about funding requirements and upcoming deadlines
- For more information see link below
  [http://iafbc.ca/funding-opportunities/poultry-biosecurity/](http://iafbc.ca/funding-opportunities/poultry-biosecurity/)

**Livestock Waste Tissue Initiative**
- Funding is available to help communities prepare for the efficient and safe disposal of all livestock carcasses generated during an emergency in B.C. whether that is a disease outbreak or natural disaster.
- Each project idea is carefully evaluated to determine:
  - How well it meets goals #4 and #6 of the livestock waste tissue strategic plan.
  - How well it meets IAF’s funding principles.
  - The level of support from other groups or agencies
- Applications can be submitted at anytime
  - Contact the LTWI coordinator to find out more about the funding requirements and the application process
- For more information see link below
  [http://iafbc.ca/funding-opportunities/lwti/](http://iafbc.ca/funding-opportunities/lwti/)

**Canadian Red Cross**
Some of the long-term food security initiatives may be eligible for Red Cross wildfire recovery funding, depending on the details. Please see the [website](http://www.redcross.ca) and email [bccommunitypartners@redcross.ca](mailto:bccommunitypartners@redcross.ca) to discuss any wildfire recovery or long-term food security project that you are wishing to carry out.
Appendices

APPENDIX 1: Northern Development Initiative Trust - Grant Writing Support Application Guide

APPENDIX 2: The Growcer Spreadsheet

APPENDIX 3: West Coast Seeds Vegetable Planning Charts
   Northern BC
   South Central BC
   Coastal BC

APPENDIX 4: Department of Fisheries and Oceans - Aquaponics Licensing Flowchart

APPENDIX 5: BC Poultry Services Guide

APPENDIX 6: Provincially Licensed Class A and B Meat Plants Pursuant to the BC Meat Inspection Regulation as of 20-Mar-18
Program Overview

The Grant Writing Support program provides annual grant funding to support a grant writing position in a local government or First Nation band within the Trust’s service region. The grant writer supports communities by preparing funding applications to agencies, foundations and government programs in order to access more funding dollars to support crucial economic development projects and initiatives throughout the region. Additionally, the grant writer provides additional capacity to support local non-profits with grant application research and writing in order to pursue community funding priorities.

Funding Terms

Up to $8,000 in grant funding to a maximum of 76% of eligible grant writer wages each calendar year.

Northern Development provides a total of $432,000 in annual funding to support 54 grant writing positions across central and northern B.C. each year. Please note that there are a limited number of spots available each year.

Eligible Applicants

- Local governments
- Registered status First Nations bands

*Eligible local governments and First Nations must be located within Northern Development’s service region.*

Application Intake Deadlines

Northern Development approves Grant Writing Support projects on an annual basis.

Applications are accepted starting November 1st, but must be received prior to midnight on January 31st to be eligible for consideration in that funding year.

The [Grant Writing Support Application Materials](#) are available on Northern Development’s website.
Review Process

Northern Development staff will contact the applicant within 30 days of receiving the application. Successful applicants will receive an approved-in-principle letter.

- As the program provides rebate funding, applicants are responsible for financially supporting the grant writer position throughout the approved year.
- If the grant writer is unknown at the time of the application, the information in section 3 of the Grant Writing Support application form must be provided to Northern Development prior to the grant writer starting employment.

Unsuccessful applicants will also receive written notification.

Eligible Positions and Ineligible Costs

Eligible Grant Writing Positions (*minimum 400 hours*)

- Dedicated full-time, part-time or on-demand grant writer (staff or contract position)
- Additional hours for an existing part-time staff member where the grant writing portion of the job is at least 30% of the total workload. A copy of the job description specifying the % of time allocated to each of the combined roles must be provided to Northern Development to be eligible for the rebate
- A new combined staff position where the grant writing portion is at least 30% of the total workload e.g., grant writing/deputy corporate officer, grant writing/economic development, grant writing/planning officer. A copy of the job description specifying the % of time allocated to each of the combined roles must be provided to Northern Development to be eligible for the rebate

Ineligible Costs

- GST and PST
- Costs incurred in time periods outside the year approved for funding support
- Travel, relocation, office expenditures, and any additional salary or benefit costs (including CPP and EI) are the responsibility of the employer
- Salary or contract costs for combined chief administrative officer/grant writer, chief financial officer/grant writer, and band administrator (or manager)/grant writer positions
Reporting Deadlines

The local government or First Nations band must submit a report no later than February 28 of the following year using Northern Development’s reporting form to verify performance measures for the program. The following performance measures are required:

a. Payroll costs for the grant writer employee/contractor verifying a minimum of $10,500 in wages and a minimum of 400 hours of employment.

b. Verification of a minimum of $200,000 grants applied for by the grant writer during the term of employment and approved calendar year (using Northern Development’s template).

c. Updates on funding application statuses marked as pending made in prior years where a grant writer was financially supported under Northern Development’s Grant Writing Support program.

Northern Development staff will review and verify complete reporting for the year and based on acceptance, a rebate of up to $8,000 is issued to the local government or First Nations band. Complete reports are required prior to February 28 of the following calendar year. Applicants will have until April 30 to submit any revised reporting or requested information. After April 30, no additional documentation will be accepted.

The Grant Writing Support Reporting Form is available on Northern Development’s website.

To Apply

Please review all program documents in detail as incomplete applications will not be reviewed.

Completed application forms with all supplementary materials should be provided electronically to Northern Development by email.

info@northerndevelopment.bc.ca

Resources

Funding Program Matrix
Available funding programs and eligibility criteria.

Questions?

Northern Development Initiative Trust
301-1268 Fifth Avenue
Prince George, BC V2L 3L2

250-561-2525
info@northerndevelopment.bc.ca
www.northerndevelopment.bc.ca

Published September 2017 – Ver. 2.6
Adobe Reader 8.0+ is required to complete this application form. If you are using an earlier version, you will not be able to save any information you enter into the form. Adobe Reader is a free download available at: http://www.adobe.com/products/acrobat/readstep2.html

+ Please ensure documents are downloaded and saved to your computer desktop prior to entering any information. If opened and completed within your internet browser, any information entered will not be saved.

**Applicant Profile**

<table>
<thead>
<tr>
<th>Community name (local government or First Nations band):</th>
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**Primary Contact Information**

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<th>Primary contact (for this application):</th>
<th>Position/title:</th>
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Complete the following if different from applicant organization contact information:

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About the Grant Writer

d. Please refer to the Grant Writing Support Application Guide for eligible positions and ineligible costs. The grant writer will work or provide services on the following basis:

- Full-time (100% dedicated grant writing position)
- Part-time (100% dedicated grant writing position)
- On-demand contract position or consultant (100% dedicated to grant writing)
- Full-time (combined position)
  - Job title: % of time dedicated to grant writing (minimum 30%): 0.00%
- Part-time (combined position)
  - Job title: % of time dedicated to grant writing (minimum 30%): 0.00%

If the community has a preferred candidate for the grant writer position, please provide the following:

<table>
<thead>
<tr>
<th>Grant writer name:</th>
<th>The grant writer is based in the community:</th>
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<td>Yes</td>
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<td>No If no, please identify location:</td>
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Briefly describe the grant writer’s background and qualifications:

If the preferred candidate is not located in the community, please provide the rationale.

If the community does not have a preferred candidate at this time, the above information must be provided to Northern Development prior to the grant writer starting employment.

4. Grant Writer Supervisor

Please identify the staff member that is directly responsible for supervising the proposed grant writer position:

<table>
<thead>
<tr>
<th>Supervisor name:</th>
<th>Position/title:</th>
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5. Grant Writer Funding

<table>
<thead>
<tr>
<th>Amount requested:</th>
<th>Community contribution:</th>
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<tbody>
<tr>
<td>$8,000 grant rebate</td>
<td>$</td>
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</table>

(minimum $2,500 community contribution within the calendar year)

6. Community Priorities

* The grant writer is required to apply for a minimum of $200,000 to support community projects.
* List the priority projects in the community that the grant writer will be focused on supporting:

<table>
<thead>
<tr>
<th>Project name:</th>
<th>Funding required:</th>
<th>Estimated total project value:</th>
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<td><strong>TOTAL</strong></td>
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7. Attachments

* Please list all documents attached to this application:

<table>
<thead>
<tr>
<th>Document name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Required (if applicable): Job description for combined position(s) specifying % spent on grant writing</td>
</tr>
</tbody>
</table>
8. Application Confirmation

I have read and understand the Grant Writing Support Application Guide including the eligible and ineligible costs. I confirm that the information in this application is accurate and complete, including attachments.

I agree that once funding is approved, any change to the project proposal will require prior approval of Northern Development Initiative Trust (Northern Development).

I agree to submit reporting materials as required by Northern Development, and where required, financial accounting for evaluation of the activity funded by Northern Development.

I understand that the information provided in this application may be accessible under the Freedom of Information (FOI) Act.

I authorize Northern Development to make enquiries, collect and share information with such persons, firms, corporations, federal and provincial government agencies/departments and non-profit organizations, as Northern Development deems necessary for decision, administration, and monitoring purposes for this project.

I agree that information provided in this application form may be shared with the appropriate regional advisory committee(s), board of directors, and consultants.

If approved for grant writing support funding, our organization agrees to submit a report by February 28 of the following year to verify the following performance measures for the program:

a. Pay stub(s) for the grant writer employee or invoice(s) for the contractor verifying a minimum of $10,500 in wages and a minimum of 400 hours of employment.

b. Verification of $200,000 grants applied for by the grant writer during the term of employment and approved calendar year (using Northern Development’s template).

c. Verification of grants approved from those applied for during the term of the program.

d. Upon request, updates on funding applications made in prior years that was financially supported under Northern Development’s Grant Writing Support program.

9. Submitting Your Application

Completed funding applications (with all required attachments) should be provided electronically to Northern Development by email. Please do not scan this form (if possible).

Email: info@northerndevelopment.bc.ca
APPENDIX 2: The Growcer Containerized Growing Systems

Containerized Growing Systems

Developed by The Growcer Modular Food Solutions (thegrowcer.ca)

Growing

Eliminate Reliance on Southern Shipments

- Regardless of volatile environmental conditions or shipping channels closing, communities are able to grow their own local food, year-round. The Growcer’s systems have been proven to grow at commercial & profitable scale from +30°C to -59°C.
- Systems are fully mobile meaning that in the case of an environmental disaster, containers can be picked up and relocated to a nearby area.
- Eliminating reliance on shipments from the south self-sufficiency; communities are able to provide themselves with 12,000 lbs of produce per system per year, equivalent to feeding 108 people, 5 servings of vegetables every single day throughout the entire year.

Health Benefits

- Year-round access to fresh, affordable produce that is easy to integrate into traditional diets.
- Access to fresh produce eliminates the need to consume less healthy, packaged food options. This means community members consume a more wholesome diet.
- Containerized growing eliminates the use of any herbicides/pesticides, and risk of vermin or other animals damaging crops.

‘Enabling communities to grow fresh, local produce year-round while simultaneously promoting economic growth and environmental sustainability’

Benefits to Containerized
Education and Employment Opportunities

- With each new system deployed, individuals are employed to help manage & operate the system and the business during day-to-day operations.
- Students and young people can learn more about their food system through classroom education programs our team coordinates.

Opportunity for Growth

- Systems are completely modular; operate a single profitable system or expand your project to include multiple systems for increased impact and profits.
- Grow your business to include light food processing and traditional foods through the use of our commercial kitchen add-on that plugs in to our growing systems.

Environmental Benefits

- Eliminate environmentally damaging food supply chains (little to no transport)
- 95% less water, and 99.7% less land is required for containerized hydroponic growing than traditional agricultural methods.

Increasing Food Security

- Ensure produce is affordable through on average, 50% reduction in food prices
- Produce yields are consistent, year-round. Each community knows exactly how much produce they will be harvesting each week, every week of the year

Implementation Process

Step One

- Initial discussion with one of our Project Consultants to determine how a containerized growing system could be optimized for each specific community
- **Profitability Assessment** – Provide us with your local power rates, current price of produce, and expected labour rate and we’ll provide a customized financial report. The online profitability calculator above uses real-world data from the Growcer’s 8 existing farms.

**Step Two**

- Evaluation of funding opportunities – Our project consultant works with you to determine available funding opportunities and assists you with your application; we will share previous successful grants, business plans, and help you write yours.
- Market Evaluation – Asses your market to determine the demand for each types of produce in your community, and begin securing purchase agreements. Our Project Consultants guide you through this process.

**Step Three**

- System manufacturing – Once funding is secured, an initial deposit kicks off manufacturing. Units typically require 8-12 weeks to manufacture and ship to your location on a flatbed truck.
- Material Ordering – Our project consultant will work with you to determine the types of seeds, and other business support bundles that each community needs

**Step Four**

- Shipping & Installation – Your containerized growing system is shipped with the first 14 months of growing materials included. We coordinate delivery and installation.
- Training & On-going support – Our team travels to your community to help with install and provide you with a full training on how to operate your farm! Training usually takes place for a week and a minimum of two trainees is recommended.

**Ongoing Support**

- Each containerized growing system is fully automated meaning that growing conditions are optimized to perfect conditions for plants every 4 seconds
- Our team remotely monitors each farm, so we can provide real-time technical support if you’re ever experiencing any sort of difficulty with system operation
Growcer containerized growing system currently operating in Churchill, Manitoba. Churchill’s farm has been yielding 400-450 pieces (or 200-250lbs) of produce weekly

Site Requirements:

- Space - 40’ long x 8’ wide x 9.5’ high. A 50’x10’ flat landing pad is recommended. Systems can also be placed on concrete SONO blocks (seen above)
- Electrical - 100A, 240-volt single phase power required (three-phase power option). Solar and backup generator add-ons are available.
- Water – Can be directly connected to water source or filled monthly with a garden hose. Requires 500-600 gal./month fresh water to refill 485 gal. main tank

Ongoing Operations

- Weekly labour of ~12 hours per system. Regular work includes:
  - Planting new seedlings in the seedling trays
  - Transplanting seedlings from seedling trays to growing racks
  - Harvesting produce from growing racks
- Monthly refill of nutrients (provided), and water refill, as well as weekly basic maintenance and cleaning by following our provided checklists and procedures.

Included in Your Purchase:

- Fully equipped Arctic Growing System (AGS)
  - Easy system is shipped with one spare of each critical part in the system to ensure that in the case of a part malfunction, there is no downtime
  - 1-year warranty on all workmanship in addition to OEM warranties on components.
- Training and Installation
  - Our team spends 5 days on-site with each new operator to assist with installation, and provide an exhaustive training on all system operations
- Consumables (14 months’ supply, which can be reordered on your own, or through us)
  - Rockwool cubes
  - Desired seeds
• Nutrients
• pH buffer
• Produce packaging

• Growing equipment
  • Seedling tray(s)
  • Harvesting tote(s)
  • pH testing strips

• Additional support options
  • Various “business support bundles” available post-purchase for different sales channels
    ▪ Include marketing assistance, additional supplies, and specific training

Contingency Planning

Critical Parts

• Each system is shipped to site with one spare part of each critical part in the system (water pumps, lights, growing trays, heater parts, fans, blower parts)
• Our team is available 24/7 to assist growers with the operations of their farm. Each farm is remotely monitored so our team can track system performance.

Permits, Insurance, and Liability Considerations:

• Permits, insurance or liabilities dependent on location and vendor practices. Our financial also model builds in a contingency/repair fund of 4% of annual sales.

Financial Breakdown

Sample Financials - Churchill, Manitoba

The financial breakdown below is for a one container project currently operating in Churchill, Manitoba. Churchill has been operating successfully since November of 2017, supplying five local stores/restaurants with fresh produce, and even operating their own produce subscription box business.

Key Metrics

• Power Rate – $0.09/kWh local power rate
• Labour Cost – $20/hr (accounting for 15 hours per week)
• Production Cost - $1.18 per plant, or $2.36 per pound
• Sale Price of Produce - $3.57 per piece of produce (selling mostly wholesale)
Annual Revenue: $82,100 (23,000 plants * 3.57 per plant)
Annual Profit: $43,800 (revenue less all costs, including depreciation and taxes)
Break Even point: 46% of growing capacity
  - This means that once 46% of the harvest is sold, the container has ‘broken even’. The additional 54% of produce grown is sold for a profit.

*Customized financial report and project consultation is conducted on an individual, community by community basis with one of our project consultants*
### APPENDIX 3: West Coast Seeds Vegetable Planning Charts

#### Vegetable Planting Chart

**northern british columbia**

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>WINTER</th>
<th>SPRING</th>
<th>SUMMER</th>
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<td>FEB</td>
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<td>Artichoke</td>
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<td>Arugula</td>
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<td>Soya beans</td>
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<td>Beans, bush &amp; pole</td>
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<td>Broccoli</td>
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<td>Broccoli, overwinter</td>
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<td>Brussels sprouts</td>
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<td>Cabbage</td>
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Long-Term Food Security Initiatives

Updated: May 18, 2018
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### Vegetable Planting Chart

**coastal british columbia**

**Vegetables**

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**Frost Dates:**
- Kamloops: May 4 - Oct 8 (156 days)
- Vernon: April 29 - Oct 4 (155 days)
- Kelowna: May 1 - Oct 5 (156 days)
- Nelson: May 4 - Oct 13 (159 days)

**Contact:**
- Retail Store: 4930A Elliott Street, Ladner, BC, Canada, V4K 2Y1
- Warehouse: 5300 34B Avenue, Delta, BC, V4L 2P1

**돼지**

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**1-888-804-8820 • www.westcoastseeds.com**
Quinoa
Radish
Rutabaga
Spinach
Squash
Swiss chard
Tomatoes
Turnips

First average frost date: November 2nd. Last average frost date: March 28th (Lower Mainland BC)
### Fall and Winter Harvest

**Families**

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<tr>
<th>JUN</th>
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#### Arugula

- Direct-sow for fall harvest

#### Beets

- Direct-sow for spring and summer harvest

#### Broccoli

- Transplant

#### Brussels sprouts

- Cover

#### Cabbage

- Harvest

#### Carrots

- Current year

#### Cauliflower

- Start indoors

#### Chervil

- Winter harvest

#### Chicory

- Summer harvest

#### Cilantro

- Transplant

#### Corn salad

- Harvest

#### Kale & Collards

- Cover

#### Kohlrabi

- Direct-sow for spring and summer harvest

#### Leeks

- Direct-sow for fall harvest

#### Lettuce

- Direct-sow for spring and summer harvest

#### Mescluns

- Transplant

#### Mustards

- Direct-sow for fall harvest

#### Pac Choi

- Direct-sow for spring and summer harvest

#### Parsley

- Transplant

#### Parsnips

- Direct-sow for spring and summer harvest

#### Peas

- Direct-sow for spring and summer harvest

#### Radish

- Direct-sow for spring and summer harvest

#### Rutabaga

- Direct-sow for spring and summer harvest

#### Scallions

- Direct-sow for spring and summer harvest

#### Sorrel

- Direct-sow for spring and summer harvest

#### Spinach

- Direct-sow for spring and summer harvest

#### Swiss chard

- Direct-sow for spring and summer harvest

#### Turnips

- Direct-sow for spring and summer harvest

### Winter Harvest and next Spring/Summer Harvest

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#### Broad Beans

- Cover

#### Broccoli, sprouting

- Direct-sow for spring and summer harvest

#### Cabbage, overwinter

- Direct-sow for spring and summer harvest

#### Cauliflower, overwinter

- Direct-sow for spring and summer harvest

#### Celeriac

- Direct-sow for spring and summer harvest

#### Garlic

- Direct-sow for spring and summer harvest

#### Onions, overwinter

- Direct-sow for spring and summer harvest

---

**ANNUAL**: Plants that completes its whole life cycle in only one year, from germination to foliage growth to flowering and seed formation. Many vegetables are annuals, and will “bolt” or produce flowers and seeds in a short period, usually triggered by heat or length of daylight hours.

**BIENNIAL**: Plants that mature in the second year of growth. The first season is spent growing leaves, and storing energy for the second season’s flowering and seed production. Examples include parsnips and beets.

**PERENNIAL**

Unlike annuals, which mature fully in one year, and biennials which take two years, perennials are plants that last for more than two years. Perennial plants overwinter by storing food either in their trunks or roots. Unlike annuals, they do not need to attempt to self-sow each summer. Some perennial plants may only last three years, or will benefit from being lifted and separated at that time by root division.

---

First average frost date: November 2nd. Last average frost date: March 28th (Lower Mainland BC)
APPENDIX 4: Department of Fisheries and Oceans – Aquaponics Licensing Flowchart

Aquaponics Licensing Flowchart

Do I need a licence from Department of Fisheries and Oceans?

Determine species of fish currently to be used in aquaponics system

- Is this species of fish listed as prohibited under the:
  - Pacific Fishery Regulations: http://laws-lois.justice.gc.ca/eng/regulations/vor-93-54/page-20.html#s58, or
  - Controlled Alien Species Regulations: http://www.env.gov.bc.ca/fw/wildlifeactreview/cas/ (Exception of Nile tilapia (Oreochromis niloticus), proceed to No)

  - Fish that are typically used for personal consumption or market sales
  - No selling permitted.

Type of fish:
- A) Ornamental (eg: carp)
- B) Food fish (eg: tilapia)

- Does/will your system connect to or discharge to fish bearing waters?

  - Yes
    - If the use of ornamental fish is for consumption, proceed to food fish section
  - No

- Is/will the fish be in:
  - A) a secured, contained environment:
    - Containers or
    - Tanks or
    - Ponds with lined bottom and predator netting where there is minimal risk of fish escape?
  - B) an uncontained environment:
    - Unlined pond with no netting?
    - Facility susceptible to flooding?
    - Unsecured where there could be potential for fish escapes?

- What is/will be the purpose of your aquaponics system?
  - A) Personal Use (biolitter, fertilizer) with no intention of selling fish, or
  - B) Selling - includes the following:
    - Any intention to sell fish for profit, and/or
    - Selling of any of fish to friends, family and neighbours or online, and/or
    - Selling fish at farmers markets, supermarkets, retail markets, restaurants

  - A) Personal Use
    - Do you stock/intend to stock your system with sterile or monosex fish species? (inability to reproduce)

    - No / Unknown
      - If your fish reproduce to the extent that your facility is incapable of accommodating, how have you / do you intend to deal with excess offspring?
      - A) Personal consumption, fish will not leave facility.
      - B) Gifting, or
      - C) Selling

    - A) Personal consumption
      - Is the recipient a licensed aquaculture facility?

    - No
      - B) Gifting
        - Are you gifting live fish?

      - Yes
        - C) Selling

    - No
      - B) Selling

- Risk assessment required

Contact BC Introductions & Transfers Committee

No Freshwater/Land-based Aquaculture Licence required

*Please ensure offspring is dealt with / disposed in an appropriate manner

**Please ensure that your aquaponics system is appropriately designed to minimize the risk of escapes (e.g. recirculation, screening, netting)

***If gifting, recipient to receive DFO Live Fish Gift Letter

****Please ensure that you and anyone you sell/gift your fish to is aware that it is an offense to release live fish into natural waters of British Columbia

Contact information

Aquaculture Management Division
Freshwater Resource Manager
Freshwater.Aquaculture@dfo-mpo.gc.ca

BC Introductions and Transfers Committee
PC Coordinator
Tel: 604-566-5519
Fax: 604-666-1079
Email: famics@dfo-mpo.gc.ca

Last Updated: December 29, 2014

It is the responsibility of the aquaponics operator to obtain all other forms of authorizations from federal/provincial agencies that may have jurisdiction over aquaponics facilities, works required to construct such facilities or requirements for the selling of fish for human consumption.

If you observe a Fisheries violation, you are encouraged to report it to the DFO Observer, Report (ORR) Line: 1-800-465-4336
### Hatcheries

<table>
<thead>
<tr>
<th>Region</th>
<th>Company</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Farmcrests Foods Ltd.</td>
<td>(250) 832-0036</td>
<td>(250) 832-2194</td>
</tr>
<tr>
<td>I</td>
<td>Okanagan Hatchery Ltd.</td>
<td>(250) 546-9223</td>
<td>(250) 546-9990</td>
</tr>
<tr>
<td>LM</td>
<td>Bradner Farms</td>
<td>(604) 856-1227</td>
<td>(604) 856-1341</td>
</tr>
<tr>
<td>LM</td>
<td>Coastline Chicks</td>
<td>(604) 852-6090</td>
<td>(604) 852-2374</td>
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<tr>
<td>LM</td>
<td>Fraser Valley Chicks</td>
<td>(604) 864-0555</td>
<td>(604) 856-7666</td>
</tr>
<tr>
<td>LM</td>
<td>Golden Feather Hatchery</td>
<td>(604) 823-4938</td>
<td>(604) 823-4707</td>
</tr>
<tr>
<td>LM</td>
<td>Sofina Hatchery</td>
<td>(604) 856-4171</td>
<td>(604) 856-3066</td>
</tr>
<tr>
<td>LM</td>
<td>Pacific Pride Chicks Ltd.</td>
<td>(604) 850-2913</td>
<td>(604) 859-2900</td>
</tr>
<tr>
<td>LM</td>
<td>Rossdown Farms Ltd.</td>
<td>(604) 856-1218</td>
<td>(604) 856-4909</td>
</tr>
<tr>
<td>LM</td>
<td>Western Hatchery Ltd.</td>
<td>(604) 859-7168</td>
<td>(604) 859-4455</td>
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I: Interior        LM: Lower Mainland    VI: Vancouver Island

### Chick Brokers

<table>
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<tr>
<th>Region</th>
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<tbody>
<tr>
<td>VI</td>
<td>439333 BC Ltd.</td>
<td>(250) 727-1083</td>
<td>(250) 478-3970</td>
</tr>
<tr>
<td>VI</td>
<td>Black Creek Farm &amp;</td>
<td>(250) 337-8922</td>
<td>(250) 337-5933</td>
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<tr>
<td>VI</td>
<td>Feed Supply Ltd.</td>
<td>(250) 748-8171</td>
<td>(250) 748-0780</td>
</tr>
<tr>
<td>VI</td>
<td>Buckerfield’s</td>
<td>(250) 337-5956</td>
<td>(250) 337-5956</td>
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<tr>
<td>VI</td>
<td>Reliable Poultry Service</td>
<td>(250) 248-4991</td>
<td>(250) 248-4169</td>
</tr>
<tr>
<td>VI</td>
<td>Shar-Kare Feeds &amp; Pet</td>
<td>(250) 248-8631</td>
<td>(250) 248-8639</td>
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<tr>
<td>VI</td>
<td>Station Farm &amp; Feed</td>
<td>(250) 248-8631</td>
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<tr>
<td>VI</td>
<td>The Striped Chicken</td>
<td>(250) 927-7455</td>
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<tr>
<td>VI</td>
<td>Feed &amp; Farm</td>
<td>(250) 746-5101</td>
<td>(250) 597-0312</td>
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<tr>
<td>VI</td>
<td>Top Shelf Feeds Inc.</td>
<td>(250) 478-8012</td>
<td>(250) 478-5537</td>
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<tr>
<td>I</td>
<td>Willow Wind Feed</td>
<td>(250) 746-5101</td>
<td>(250) 597-0312</td>
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<tr>
<td>I</td>
<td>Blackbird Organics</td>
<td>(250) 499-9044</td>
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<tr>
<td>I</td>
<td>Bland, Stanley &amp; Laura</td>
<td>(250) 832-6615</td>
<td>(250) 832-7615</td>
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<tr>
<td>I</td>
<td>Newsat Farms</td>
<td>(250) 567-3197</td>
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<tr>
<td>LM</td>
<td>Claim Jumper Farms</td>
<td>(778) 829-6569</td>
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<tr>
<td>LM</td>
<td>T &amp; C Chick Sales</td>
<td>(604) 828-2525</td>
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<tr>
<td>LM</td>
<td>W. Friesen</td>
<td>(604) 541-8799</td>
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## Processors

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<tbody>
<tr>
<td>VI</td>
<td>Island Farmhouse Poultry</td>
<td>(604)856-6698</td>
<td>(604) 856-4909</td>
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<tr>
<td>VI</td>
<td>Kildonan Farm</td>
<td>(250)656-3900</td>
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<tr>
<td>VI</td>
<td>Paradise Meadows Poultry</td>
<td>(250)897-6982</td>
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<tr>
<td>VI</td>
<td>Salt Spring Abattoir Society</td>
<td>(778)354-1111</td>
<td></td>
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<tr>
<td>VI</td>
<td>Stonecroft Farm</td>
<td>(250)337-2040</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Arenbrook Acres</td>
<td>(250) 379-2007</td>
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<tr>
<td>I</td>
<td>Colonial Farms Ltd.</td>
<td>(250) 546-3008</td>
<td>(250) 546-6065</td>
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<tr>
<td>I</td>
<td>Farmcrest Foods Ltd.</td>
<td>(250) 832-0036</td>
<td>(250) 832-2194</td>
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<tr>
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<td>Newsat Farms</td>
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<tr>
<td>I</td>
<td>Passmore Pluckers Inc.</td>
<td>(250)505-9632</td>
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<tr>
<td>I</td>
<td>Peace Country Poultry</td>
<td>(250) 789-3010</td>
<td>(250) 789-3058</td>
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<tr>
<td>I</td>
<td>Pluckin' Maniacs</td>
<td>(250) 314-1007</td>
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<tr>
<td>I</td>
<td>Rainer Custom Cutting</td>
<td>(250) 672-9629</td>
<td>(250) 672-9517</td>
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<tr>
<td>I</td>
<td>Silvernails Abattoir</td>
<td>(250) 558-9496</td>
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<tr>
<td>I</td>
<td>South Peace Colony</td>
<td>(250) 784-4123</td>
<td>(250) 663-8782</td>
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<tr>
<td>LM</td>
<td>Hallmark Poultry Processors Ltd.</td>
<td>(604) 254-9885</td>
<td>(604) 254-7039</td>
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<tr>
<td>LM</td>
<td>Farm Fed</td>
<td>(604) 850-5808</td>
<td>(604) 850-5838</td>
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<tr>
<td>LM</td>
<td>Fraser Valley Specialty</td>
<td>(604) 823-4435</td>
<td>(604) 823-4306</td>
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<td>LM</td>
<td>Rossdown Natural Foods</td>
<td>(604) 856-6698</td>
<td>(604) 856-4909</td>
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<tr>
<td>LM</td>
<td>Sofina Foods Inc.</td>
<td>(604) 941-4041</td>
<td>(604) 941-7466</td>
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<tr>
<td>LM</td>
<td>Sunrise Poultry Processors</td>
<td>(604) 596-9505</td>
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<tr>
<td>LM</td>
<td>Superior Poultry Processors</td>
<td>(604) 254-7039</td>
<td>(604) 254-7039</td>
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<tr>
<td>LM</td>
<td>United Poultry Co. Ltd.</td>
<td>(604) 255-9308</td>
<td>(604) 254-6581</td>
</tr>
<tr>
<td>LM</td>
<td>Wing Tat Game Bird Packers Inc.</td>
<td>(604) 882-0054</td>
<td>(604) 882-0056</td>
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**Note:** Custom Kill Processors are in **Red**.
# Feed Companies

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<thead>
<tr>
<th>Region</th>
<th>Company</th>
<th>Address</th>
<th>City</th>
<th>Postal</th>
<th>Phone</th>
<th>Email / Fax</th>
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<tbody>
<tr>
<td></td>
<td>Sure Crop Feeds</td>
<td>6368 Hwy 97A N</td>
<td>Grinrod</td>
<td>V0E 1Y0</td>
<td>(250) 833-7579</td>
<td><a href="mailto:orderdesk@surecropfeeds.com">orderdesk@surecropfeeds.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>Bradner Feeds</td>
<td>8670 58th Ave</td>
<td>Abbotsford</td>
<td>V4X 2E8</td>
<td>(604) 856-1227</td>
<td><a href="mailto:bradfeed@telus.net">bradfeed@telus.net</a></td>
</tr>
<tr>
<td>LM</td>
<td>Organic Feeds</td>
<td>1665 Standeven Rd</td>
<td>Chilliwack</td>
<td>V2P 6H4</td>
<td>(604) 794-3701</td>
<td><a href="mailto:organicfeeds@gmail.com">organicfeeds@gmail.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>Clearbrook Grain &amp; Milling</td>
<td>2425 Townline Rd</td>
<td>Abbotsford</td>
<td>V2T 6L6</td>
<td>(604) 853-5901</td>
<td></td>
</tr>
<tr>
<td>LM</td>
<td>Hi-Pro Feeds</td>
<td>46255 Chilliwack Central Rd</td>
<td>Chilliwack</td>
<td>V2P 1J7</td>
<td>(604) 702-4500</td>
<td><a href="mailto:webmaster@hiprofeeds.com">webmaster@hiprofeeds.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>Otter Co-Op</td>
<td>3600 – 248th St</td>
<td>Aldergrove</td>
<td>V4W 2V1</td>
<td>(604) 607-6901</td>
<td><a href="mailto:feedmgr@otter-coop.com">feedmgr@otter-coop.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>Paragon Feeds</td>
<td>410 Ross Rd</td>
<td>Abbotsford</td>
<td>V2X 2M5</td>
<td>(604) 856-2192</td>
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</tr>
<tr>
<td>LM</td>
<td>Ritchie-Smith Feeds</td>
<td>3377 Enterprise Ave</td>
<td>Abbotsford</td>
<td>V2S 7T9</td>
<td>(604) 853-3333</td>
<td>(604) 859-7011</td>
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<tr>
<td>LM</td>
<td>Rossdown Farms</td>
<td>2325 Bradner Rd</td>
<td>Abbotsford</td>
<td>V4X 1E2</td>
<td>(604) 856-6698</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>Top Shelf Feeds</td>
<td>2800 Roberts Rd</td>
<td>Duncan</td>
<td>V9L 3Y1</td>
<td>(250) 746-5101</td>
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# Equipment Suppliers

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<tr>
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<tr>
<td>LM</td>
<td>Jonkman Equipment</td>
<td>28355 Fraser Hwy</td>
<td>Abbotsford</td>
<td>V4X 1K9</td>
<td>(604) 857-2000</td>
<td><a href="mailto:info@jonkmanequipment.com">info@jonkmanequipment.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>United Agri-Systems</td>
<td>2365 W. Railway St 5555</td>
<td>Abbotsford</td>
<td>V2S 2E3</td>
<td>(604) 859-4240</td>
<td><a href="mailto:info@unitedagri.com">info@unitedagri.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>Precision Farm Supplies Ltd.</td>
<td>Interprovincial Hwy</td>
<td>Abbotsford</td>
<td>V3G 2P5</td>
<td>(778) 809-4858</td>
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### Cleanout & Disinfection

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<td>LM</td>
<td>B &amp; B Cleanout</td>
<td>3673 Ross Rd</td>
<td>Abbotsford</td>
<td>V4X 1T1</td>
<td>(604)-851-5940</td>
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<tr>
<td>LM</td>
<td>Flokstra Farm Services</td>
<td>47104 Yale Rd</td>
<td>Chilliwack</td>
<td>V2P 2S7</td>
<td>(604)-997-9750</td>
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<tr>
<td>LM</td>
<td>Doni’s Sprayers</td>
<td>34192 Fraser St</td>
<td>Abbotsford</td>
<td>V2S 1X7</td>
<td>(778)-240-8925</td>
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<tr>
<td>LM</td>
<td>Enviro Poultry Farm Services</td>
<td>Box 1449</td>
<td>Aldergrove</td>
<td>V4W 2V1</td>
<td>(604)-308-8388</td>
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<tr>
<td>LM</td>
<td>Farm Boys Cleaning Services</td>
<td>4995 Bates Rd</td>
<td>Abbotsford</td>
<td>V4X 1W3</td>
<td>(778)-344-2548</td>
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<tr>
<td>LM</td>
<td>Paradigm Maintenance &amp; Farm Services</td>
<td>1839 Dahl Crescent</td>
<td>Abbotsford</td>
<td>V2S 4B3</td>
<td>(604)-866-0203</td>
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<tr>
<td>LM</td>
<td>Ridge Valley Cleanout</td>
<td>30974 Burgess Rd</td>
<td>Abbotsford</td>
<td>V4X 2A6</td>
<td>(604)-864-7644</td>
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<tr>
<td>LM</td>
<td>Triple G Cleanout</td>
<td>Box 44</td>
<td>Mt. Lehman</td>
<td>V4X 2P7</td>
<td>(604)-856-7913</td>
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<tr>
<td>LM</td>
<td>Valley Farm Sprayers</td>
<td>26975 – 28a Ave</td>
<td>Aldergrove</td>
<td>V4W 3A1</td>
<td>(604)-856-3922</td>
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<tr>
<td>LM</td>
<td>Valley Pressure Washing</td>
<td>3392 Allen Ave</td>
<td>Abbotsford</td>
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<td>(778)-241-6042</td>
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<tr>
<td>VI</td>
<td>PJ’s Powerwashing Ltd</td>
<td>PO Box 405</td>
<td>Duncan</td>
<td>V9L 3X5</td>
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### Bedding Suppliers

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<tr>
<td>I</td>
<td>Reimer’s Farm Service</td>
<td>105 Hwy 97B</td>
<td>Enderby</td>
<td>V0E 1V3</td>
<td>(250)-838-0111</td>
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<td>LM</td>
<td>Alray Shavings Ltd.</td>
<td>5904 Interprovincial Hwy</td>
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<td>V3G 2P8</td>
<td>(604)-823-6296</td>
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<td>LM</td>
<td>Denbow</td>
<td>40874 Yale Rd</td>
<td>Chilliwack</td>
<td>V2R 4J2</td>
<td>(604)-823-6647</td>
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<td>Groothof Trucking Ltd.</td>
<td>2857 McDermott Rd</td>
<td>Abbotsford</td>
<td>V3G 2J7</td>
<td>(604)-850-4359</td>
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<tr>
<td>LM</td>
<td>Ground Cover</td>
<td>1702 Foy Street</td>
<td>Abbotsford</td>
<td>V2T 6B1</td>
<td>(604)-850-0220</td>
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<tr>
<td>LM</td>
<td>Healey Hay &amp; Strawdust Supply</td>
<td>4304 Dixon Rd</td>
<td>Abbotsford</td>
<td>V3G 2H3</td>
<td>(604)-864-3922</td>
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<tr>
<td>LM</td>
<td>Valley Pulp &amp; Sawdust Carriers</td>
<td>4491 Gladwin Rd</td>
<td>Abbotsford</td>
<td>V4X 1W6</td>
<td>(604)-853-1075</td>
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<tr>
<td>VI</td>
<td>Macnutt Enterprises</td>
<td>1820 Schoolhouse Rd</td>
<td>Nanaimo</td>
<td>V9X 1T4</td>
<td>(250)-714-1112</td>
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### Veterinarians

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<tbody>
<tr>
<td>LM</td>
<td>Ambrose Poultry Consulting</td>
<td>Dr. Neil Ambrose</td>
<td>Abbotsford</td>
<td>(604) 302-1352</td>
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<tr>
<td>LM</td>
<td>BC Ministry of Agriculture: Animal Health Centre</td>
<td>Dr. Bill Cox</td>
<td>Abbotsford</td>
<td>(604) 856-3150</td>
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<tr>
<td>LM</td>
<td>Canadian Poultry Consultants</td>
<td>Dr. Stew Ritchie</td>
<td>Abbotsford</td>
<td>(604) 854-6600</td>
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<tr>
<td>LM</td>
<td>Poultry Plus Veterinary Consulting</td>
<td>Dr. Ralph Hopkins</td>
<td>Abbotsford</td>
<td>(604) 852-2820</td>
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### Water Sampling

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<tbody>
<tr>
<td>LM</td>
<td>Exova</td>
<td>104 – 19575 55A Ave</td>
<td>Surrey</td>
<td>(604) 514-3322</td>
<td><a href="mailto:americas@exova.com">americas@exova.com</a></td>
</tr>
<tr>
<td>LM</td>
<td>Fraser Analytical Services</td>
<td>1356 Sumas Way</td>
<td>Abbotsford</td>
<td>(604) 557-1486</td>
<td><a href="mailto:info@fraseranalytical.com">info@fraseranalytical.com</a></td>
</tr>
<tr>
<td>VI</td>
<td>MB Labs Ltd.</td>
<td>PO Box 2103</td>
<td>Sidney</td>
<td>(250) 656-1334</td>
<td><a href="mailto:mblabs@pacificcoast.net">mblabs@pacificcoast.net</a></td>
</tr>
<tr>
<td>VI</td>
<td>North Island Labs</td>
<td>532B Comox Rd</td>
<td>Nanaimo</td>
<td>(250) 716-8731</td>
<td><a href="mailto:nilabs@telus.net">nilabs@telus.net</a></td>
</tr>
</tbody>
</table>

Contact the Board Office for a list of Mentors.

### Additional Contacts

- **BC Chicken Marketing Board**
  - Production – Arlene Oslie
  - New Entrant Program – Shawn Mallon
  - Auditing & Inspection – Kathy Erickson
  - [www.bcchicken.ca](http://www.bcchicken.ca)
  - (604) 859-2868
  - info@bcchicken.ca

- **BC Grower’s Association**
  - Margret Duin
  - [office@bcchickengrowers.ca](mailto:office@bcchickengrowers.ca)
  - (604) 859-9332

- **Chicken Farmers of Canada**
  - [www.chicken.ca](http://www.chicken.ca)
APPENDIX 6: Provincially Licensed Class A and B Meat Plants Pursuant to the BC Meat Inspection Regulations as of 20-Mar-18

Provincially Licensed Class A and B Meat Plants
Pursuant to the BC Meat Inspection Regulation as of
20-Mar-18

"Class A " Slaughter Establishments

<table>
<thead>
<tr>
<th>Class A Slaughter Establishments</th>
<th>Class B Slaughter Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10009392 BC Ltd</td>
<td>AGM Beef Farm Ltd</td>
</tr>
<tr>
<td>BC 47</td>
<td>BC 08</td>
</tr>
<tr>
<td>Dave DeBoer</td>
<td>Kenneth Kooyman</td>
</tr>
<tr>
<td>4141 54 ST SE</td>
<td>5175 184th St</td>
</tr>
<tr>
<td>Salmon Arm BC V1E3P8</td>
<td>Surrey BC V4P1M5</td>
</tr>
<tr>
<td>250.833.5111</td>
<td>604.576.8318</td>
</tr>
<tr>
<td>Swine</td>
<td>Cows/Cattle, Sheep/Lamb/Goats, Llama/Alpaca</td>
</tr>
</tbody>
</table>

| Al's Feathers Be Gone            | Armstrong Artisan Meats           |
| BC 39                            | BC 70                             |
| Alistair Harley                  | Angeline Hallam                   |
| 6795 Swanson Rd W                | 5222 Back Enderby Rd              |
| Port Alberni BC V9Y8L7           | Armstrong BC V0E1B8               |
| 250.723.8307                     | 250.546.3500                      |
| Poultry                          | Poultry                           |

| Braun's Custom Butcher Shop      | Bulkley Valley Custom Slaughter   |
| BC 52                            | BC 23                             |
| Alfred Braun                     | Manfred Wittwer                   |
| 3901 Rowe Rd                     | 5986 Donaldson Rd                 |
| Duncan BC V9L6T1                 | Telkwa BC V0J2X0                   |
| 250.746.6507                     | 250.846.5168                      |
| Cows/Cattle, Swine, Sheep/Lamb/Goats, Llama/Alpaca | Poultry, Rabbit |

A = Slaughter & Processing; B = Slaughter Only
<table>
<thead>
<tr>
<th><strong>Class A</strong> Slaughter Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Campbell Farm</strong></td>
</tr>
<tr>
<td>BC 32</td>
</tr>
<tr>
<td>Jacques Campbell</td>
</tr>
<tr>
<td>102 Quarry</td>
</tr>
<tr>
<td>Saturna Island BC V0N2Y0</td>
</tr>
<tr>
<td>250.539.2470</td>
</tr>
<tr>
<td><em>Cows/Cattle, Sheep/Lambs/Goats</em></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Cluck Stops Here, The</strong></td>
</tr>
<tr>
<td>BC 38</td>
</tr>
<tr>
<td>Lori Gillis</td>
</tr>
<tr>
<td>1229 Walz Rd</td>
</tr>
<tr>
<td>Qualicum BC V9K2S8</td>
</tr>
<tr>
<td>250.752.3082</td>
</tr>
<tr>
<td><em>Poultry</em></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Country Locker</strong></td>
</tr>
<tr>
<td>BC 28</td>
</tr>
<tr>
<td>Dwain Funk</td>
</tr>
<tr>
<td>6900 Teichroeb Rd</td>
</tr>
<tr>
<td>Vanderhoof BC V0J3A0</td>
</tr>
<tr>
<td>250.567.4774</td>
</tr>
<tr>
<td><em>Cows/Cattle, Swine, Sheep/Lambs/Goats</em></td>
</tr>
</tbody>
</table>

* A = Slaughter & Processing; B = Slaughter Only
<table>
<thead>
<tr>
<th>Establishments</th>
<th>Address</th>
<th>Contact Person</th>
<th>Phone Number</th>
<th>Animal Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraser Valley Specialty Poultry</td>
<td>4540 Simmons Rd</td>
<td>Ken Falk</td>
<td>604.823.4435</td>
<td>Poultry</td>
</tr>
<tr>
<td>Greendale Poultry</td>
<td>5888 Blackburn Rd</td>
<td>Richard Gosse</td>
<td>604.795.1455</td>
<td>Poultry, Rabbit</td>
</tr>
<tr>
<td>Gunter Bros Meat Co Ltd</td>
<td>6200 Ledingham Rd</td>
<td>Dennis Gunter</td>
<td>250.334.2960</td>
<td>Cows/Cattle, Hogs, Sheep/Lamb/Goats, Rabbits</td>
</tr>
<tr>
<td>Gwinner's Country Butcher</td>
<td>2230 Thomason Road</td>
<td>Uwe Gwinner</td>
<td>250.427.5049</td>
<td>Cows/Cattle, Sheep/Lambs/Goats, Swine</td>
</tr>
<tr>
<td>Hidden Valley Processing</td>
<td>6010 Old Cowichan Lake Rd</td>
<td>Mark Cardin</td>
<td>250.746.7235</td>
<td>Cows/Cattle</td>
</tr>
<tr>
<td>Island Farmhouse Poultry Ltd</td>
<td>1615 Koksilah Rd</td>
<td>Dion Wiebe</td>
<td>250.746.6163</td>
<td>Poultry</td>
</tr>
</tbody>
</table>

A = Slaughter & Processing; B = Slaughter Only
### "Class A" Slaughter Establishments

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Address Details</th>
<th>Contact Details</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnston Packers Ltd</td>
<td>BC 02 5828 Promontory Rd</td>
<td>Matt Ball, Ronald Keely</td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats, Bison/Buffalo, Alpacas</td>
</tr>
<tr>
<td>Kam Lake View Meats</td>
<td>BC 24 6453 Buckhorn Rd</td>
<td></td>
<td>Cows/Cattle, Sheep/Lamb/Goats, Swine, Bison, Ostrich</td>
</tr>
<tr>
<td>Kawano Farms</td>
<td>BC 19 11030 Old Cariboo Hwy</td>
<td>Larry Noullett, Sue Haley</td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats, Bison/Buffalo, Alpacas</td>
</tr>
<tr>
<td>Kelowna Free Graze Lamb</td>
<td>BC 43 1-3652 Spiers Rd</td>
<td></td>
<td>Sheep/Lamb/Goats</td>
</tr>
<tr>
<td>Kildonan Farm Fine Foods</td>
<td>BC 10 1583 Munro Rd</td>
<td>Murray Hull, Dan Strasky</td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats, Bison/Buffalo, Llamas</td>
</tr>
<tr>
<td>Lawrence Meat Packing Co Ltd</td>
<td>BC 81 1013 102nd Ave</td>
<td></td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats, Bison/Buffalo, Llamas</td>
</tr>
</tbody>
</table>

A = Slaughter & Processing; B = Slaughter Only
### "Class A " Slaughter Establishments

<table>
<thead>
<tr>
<th>Maplewood Farms</th>
<th>Village Butchers</th>
<th>Meadow Valley Meats</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 01</td>
<td>William Nikkels</td>
<td>BC 34</td>
</tr>
<tr>
<td></td>
<td>755 Winfall Rd</td>
<td>Brian Bilkes</td>
</tr>
<tr>
<td></td>
<td>Victoria BC V9B5B4</td>
<td>18315 Ford Rd</td>
</tr>
<tr>
<td></td>
<td>250.478.2041</td>
<td>Pitt Meadows BC V3Y1Z1</td>
</tr>
<tr>
<td></td>
<td>Sheep/Lamb/Goats</td>
<td>604.465.4752</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sheep/Lamb/Goats, Cattle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>My-Les Poultry</th>
<th></th>
<th>Newsat Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 63</td>
<td>Leslie Downey</td>
<td>BC 66</td>
</tr>
<tr>
<td></td>
<td>2432 Stark Rd</td>
<td>Dennis Richardson</td>
</tr>
<tr>
<td></td>
<td>Pritchard BC V0E2P0</td>
<td>18706 Langston Rd</td>
</tr>
<tr>
<td></td>
<td>250.577.3763</td>
<td>Vanderhoof BC V0J3A1</td>
</tr>
<tr>
<td></td>
<td>Poultry</td>
<td>250.567.3197</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poultry, Rabbit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>North Okanagan Poultry Processing Inc.</th>
<th>Paradise Meadows Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 69</td>
<td>BC 37</td>
</tr>
<tr>
<td>Erika Davidson</td>
<td>Gordon Peter</td>
</tr>
<tr>
<td>99 Anderson Rd</td>
<td>8486 Island Hwy</td>
</tr>
<tr>
<td>Enderby BC V0E1V4</td>
<td>Black Creek BC V9J1M3</td>
</tr>
<tr>
<td>250.803.8803</td>
<td>250.897.8008</td>
</tr>
<tr>
<td>Poultry</td>
<td>Poultry</td>
</tr>
</tbody>
</table>

*A = Slaughter & Processing; B = Slaughter Only*
### "Class A" Slaughter Establishments

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Address</th>
<th>Phone</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peace Country Poultry</strong></td>
<td>NE of Farmington on Triangle Rd, Mile 22</td>
<td>250.789.3018</td>
<td>Poultry</td>
</tr>
<tr>
<td></td>
<td>Farmington BC V0C1N0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rainer Custom Cutting</strong></td>
<td>7493 Darlington Creek Rd</td>
<td>250.672.9407</td>
<td>Poultry, Cows/Cattle, Swine, Sheep/Lamb/Goats, Bison</td>
</tr>
<tr>
<td></td>
<td>Darfield BC V0E1R0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rod Plecas Livestock Service</strong></td>
<td>2100 Plecas Rd</td>
<td>250.754.6838</td>
<td>Cows/Cattle, Hogs, Sheep/Lambs/Goats, Rabbits</td>
</tr>
<tr>
<td></td>
<td>Nanaimo BC V9X1R9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rodear Meats Ltd</strong></td>
<td>3736 Beaver Valley Rd, Box 15</td>
<td>250.243.2340</td>
<td>Cows/Cattle, Swine</td>
</tr>
<tr>
<td></td>
<td>Big Lake BC V0L1G0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Salt Spring Island Abattoir</strong></td>
<td>1447B Fulford Ganges Rd</td>
<td>778.354.1111</td>
<td>Poultry, Sheep/Lamb/Goats, Swine, Cows/Cattle</td>
</tr>
<tr>
<td></td>
<td>Salt Spring Island BC V8K1B2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scott's Meats Ltd</strong></td>
<td>2310 Scott Rd, RR2</td>
<td>604.796.9002</td>
<td>Cows/Cattle, Sheep/Lambs/Goats</td>
</tr>
<tr>
<td></td>
<td>Agassiz BC V0M1A0</td>
<td></td>
<td></td>
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</tbody>
</table>

*A = Slaughter & Processing; B = Slaughter Only*
Provincially Licensed Class A and B Meat Plants
Pursuant to the BC Meat Inspection Regulation as of 20-Mar-18

"Class A " Slaughter Establishments

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Slaughter Type</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silvernails Abattoir</td>
<td>Poultry</td>
<td>Falkland BC V0E1W0</td>
<td>250.309.2317</td>
</tr>
<tr>
<td>Somerset Farm</td>
<td>Cows/Cattle</td>
<td>Gabriola Island BC V0R1X7</td>
<td>250.247.9202</td>
</tr>
<tr>
<td>South Peace Colony Meats</td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats, Bison/Buffalo</td>
<td>Farmington BC V0C1N0</td>
<td>250.782.8164</td>
</tr>
<tr>
<td>South Peace Colony Poultry Farm</td>
<td>Poultry</td>
<td>Farmington BC V0C1N0</td>
<td>250.719.3945</td>
</tr>
<tr>
<td>Spokin Lake Meats</td>
<td>Cows/Cattle, Rabbit</td>
<td>150 Mile House BC V0K2G0</td>
<td>250.296.4355</td>
</tr>
<tr>
<td>Valley Wide Meats</td>
<td>Cows/Cattle, Llama/Alpaca, Swine, Ostrich, Sheep/Lamb/Goats, Rabbit</td>
<td>Enderby BC V0E1V4</td>
<td>250.838.7980</td>
</tr>
</tbody>
</table>

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Provincially Licensed Class A and B Meat Plants
Pursuant to the BC Meat Inspection Regulation as of
20-Mar-18

"Class A " Slaughter Establishments

<table>
<thead>
<tr>
<th>Valleyview Farms</th>
<th>Westholme Meat Packers Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 09</td>
<td>BC 12</td>
</tr>
<tr>
<td>George Gomerich</td>
<td>Norman Quist</td>
</tr>
<tr>
<td>2322 Gomerich Rd</td>
<td>7824 Westholme Rd</td>
</tr>
<tr>
<td>Nanaimo BC V9X1R9</td>
<td>Westholme BC V0R1K0</td>
</tr>
<tr>
<td>250.753.1753</td>
<td>250.246.9500</td>
</tr>
</tbody>
</table>

*Cows/Cattle, Hogs, Sheep/Lambs/Goats, Rabbits*  *Poultry, Cows/Cattle, Hogs, Sheep/Lambs/Goats, Rabbits*
<table>
<thead>
<tr>
<th>&quot;Class B &quot; Slaughter Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arenbrook Acres</strong></td>
</tr>
<tr>
<td>BC 60</td>
</tr>
<tr>
<td>Margaret (Peggy) Thompson</td>
</tr>
<tr>
<td>4325 Culling Rd</td>
</tr>
<tr>
<td>Falkland BC V0E1W1</td>
</tr>
<tr>
<td>250.379.2007</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Bulkley Valley Custom Slaughter</strong></td>
</tr>
<tr>
<td>BC 23</td>
</tr>
<tr>
<td>Manfred Wittwer</td>
</tr>
<tr>
<td>5986 Donaldson Rd</td>
</tr>
<tr>
<td>Telkwa BC V0J2X0</td>
</tr>
<tr>
<td>250.846.5168</td>
</tr>
<tr>
<td><strong>Cows/Cattle, Swine, Sheep/Goats</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Chuckureese Abattoir</strong></td>
</tr>
<tr>
<td>BC 82</td>
</tr>
<tr>
<td>Curtis Smith</td>
</tr>
<tr>
<td>2427 20th St</td>
</tr>
<tr>
<td>Creston BC V0B1G6</td>
</tr>
<tr>
<td>250.254.2427</td>
</tr>
<tr>
<td><strong>Poultry, Rabbits</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Copper Mountain Farms</strong></td>
</tr>
<tr>
<td>BC 84</td>
</tr>
<tr>
<td>Josee Lang</td>
</tr>
<tr>
<td>6309 Buckhorn Rd</td>
</tr>
<tr>
<td>Kamloops BC V1S2A1</td>
</tr>
<tr>
<td>250.828.2293</td>
</tr>
<tr>
<td><strong>Poultry, Rabbits</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Don MacKay and Nancie MacKay</strong></td>
</tr>
<tr>
<td>BC 71</td>
</tr>
<tr>
<td>Don MacKay</td>
</tr>
<tr>
<td>6076 Dixon Dam Rd</td>
</tr>
<tr>
<td>Vernon BC V1B3J8</td>
</tr>
<tr>
<td>250.542.4814</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>East Kootenay Poultry</strong></td>
</tr>
<tr>
<td>BC 65</td>
</tr>
<tr>
<td>Edward Jung</td>
</tr>
<tr>
<td>2704 37th St</td>
</tr>
<tr>
<td>South Cranbrook BC V1C7H1</td>
</tr>
<tr>
<td>778.517.5340</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*A* = Slaughter & Processing; *B* = Slaughter Only
### Class B Slaughter Establishments

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Address 1</th>
<th>Address 2</th>
<th>Phone</th>
<th>Product(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairline Development Canada (1992) Ltd</td>
<td>Alan Leung 2391 Vauxhall Pl</td>
<td>Richmond BC V6V1Z5</td>
<td>604.276.2886</td>
<td>Poultry, Cows/Cattle, Swine, Sheep/Lamb/Goats</td>
</tr>
<tr>
<td>Findlay Meats Ltd - BC FPA</td>
<td>Robert Morrison 590 Horse Lake Rd</td>
<td>100 Mile House BC V0K2E0</td>
<td>250.395.2578</td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Address 1</th>
<th>Address 2</th>
<th>Phone</th>
<th>Product(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Creek Custom Meats Inc</td>
<td>Rick Armstrong 3256 Gold Creek Rd</td>
<td>Cranbrook BC V1C6Z4</td>
<td>250.426.7770</td>
<td>Cows/Cattle, Sheep/Lamb/Goats, Swine</td>
</tr>
<tr>
<td>Kootenay Mobile Poultry Abattoir</td>
<td>Gerald Brinders 2540 Godderis Rd</td>
<td>Cranbrook BC V1C7B8</td>
<td>250.489.5798</td>
<td>Poultry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Address 1</th>
<th>Address 2</th>
<th>Phone</th>
<th>Product(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Las Palomas Farms</td>
<td>Fernado Enns 4210 Stewart Rd</td>
<td>Chilliwack BC V2R5G2</td>
<td>604.308.3091</td>
<td>Poultry</td>
</tr>
<tr>
<td>Longhorn Farms Abattoir</td>
<td>Dave Marshall 2511 Old Vernon Rd</td>
<td>Kelowna BC V1X6N8</td>
<td>250.765.4396</td>
<td>Cows/Cattle</td>
</tr>
</tbody>
</table>

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Provincially Licensed Class A and B Meat Plants
Pursuant to the BC Meat Inspection Regulation as of
20-Mar-18

"Class B " Slaughter Establishments

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Address 1</th>
<th>Address 2</th>
<th>Contact 1</th>
<th>Contact 2</th>
<th>Phone 1</th>
<th>Phone 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnum Meats Abattoir</td>
<td>BC 48</td>
<td>Chad Maarhuis</td>
<td>3790 Hwy 3</td>
<td>Rock Creek BC V0H1Y0</td>
<td>250.528.0147</td>
<td>Cows/Cattle, Swine, Sheep/Lamb/Goats, Poultry, Emu/Ostrich.</td>
</tr>
<tr>
<td>Rocky Acres Ranch</td>
<td>BC 44</td>
<td>Doug C Temple</td>
<td>9983 Stephenson Rd</td>
<td>Hosmer BC V0B1M5</td>
<td>250.423.7400</td>
<td>Cows/Cattle; Bison/Buffalo; Sheep/Lamb/Goats; Swine</td>
</tr>
<tr>
<td>StoneCroft Farm</td>
<td>BC 31</td>
<td>Kathy Beaton</td>
<td>2165 Kelland Rd</td>
<td>Black Creek BC V9J1G4</td>
<td>250.337.5789</td>
<td>Poultry</td>
</tr>
<tr>
<td>Tarzwell Farms</td>
<td>BC 35</td>
<td>Tom Tarzwell</td>
<td>524 Williams Rd</td>
<td>Creston BC V0B1G8</td>
<td>250.428.4316</td>
<td>Cows/Cattle, Bison/Buffalo, Sheep/Lamb/Goat, Swine, Rabbit</td>
</tr>
<tr>
<td>XH Buffalo Ranch</td>
<td>BC 50</td>
<td>Elisabeth Karlen</td>
<td>938 South Green Lake Rd, RR1</td>
<td>70 Mile House BC V0K2K2</td>
<td>250.456.2319</td>
<td>Cows/Cattle, Bison/Buffalo</td>
</tr>
</tbody>
</table>

A = Slaughter & Processing; B = Slaughter Only

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