Ministry of Agriculture
BRIEFING NOTE FOR MINISTER FOR INFORMATION

Ref: 184671 Date: July 4, 2016

Issue: Information on housing in the Agricultural Land Reserve (ALR)

Background: Recent media coverage has highlighted a decision by Kelowna city council not to approve a proposal from a land-owner to construct a multi-unit residential building to accommodate up to 27 temporary foreign agricultural workers. City staff have cited concerns that buildings constructed for the purpose of accommodating temporary farm help (regardless of the workers' country of residence) may be converted to rental units to provide a longer-term revenue stream and creating additional demands after the fact on city and Agricultural Land Commission (ALC) resources for compliance and enforcement activities.

Housing in the Agricultural Land Reserve (ALR) falls under a complex legislative framework, including the *Agricultural Land Commission Act* (ALCA) and the Agricultural Land Reserve Use, Sub-Division and Procedure Regulation (regulation) as well as policies set by the ALC to interpret the regulation, the *Local Government Act* (LGA) and related Minister's Bylaw Standards and BC Building Code, as well as other indirectly-related requirements (e.g. public health and safety, immigration, water sustainability) under the control of other provincial and federal agencies.

ALCA, its regulation and ALC policies
Section 18 of the ALCA prevents a local government (unless otherwise permitted to do so in the Act and regulation) from approving the construction of more than one residence on an ALR parcel, unless the additional residences are necessary for farm use, which could include housing for farm workers. The ALCA and the regulation do not set a limit on the number of additional residences for farm help accommodation per parcel.

ALC Policy #9 – Additional Residences for Farm Help Accommodation specifies that local governments must be satisfied that all residences are necessary for farm use and suggests that the parcel should have "farm" classification under the *Assessment Act* as a criterion to help determine "necessity." The policy does not distinguish between temporary versus permanent accommodation. If the need for additional residences is unclear, the policy requires that an application be made to the ALC.

ALC Policy #10 – Building new Residence While Occupying Existing Residence clarifies that an application for non-farm use is not required where there is an existing residence on the parcel that will be demolished, moved off the parcel or made uninhabitable upon occupancy of the new residence, and a bond or Letter of Credit or Statutory Declaration providing assurance to this effect is on file with the authority responsible for issuing the building permit.

Part 2 of the Regulation defines non-farm uses that are permitted in the ALR unless otherwise prohibited by a local government bylaw, including the construction of housing. Under Section 3(1), land-owners in both Zone 1 and 2 may construct a secondary suite in a single-family dwelling and either (i) one manufactured home, up to 9m wide, for use by a member of the owner's immediate family[i] or (ii) accommodation that is constructed above an existing single-storey building on the farm. In Zone 2, land-owners may also construct a second single family dwelling, provided (i) the parcel meets minimum size requirements (i.e. 50 ha) and (ii) the total area occupied by all residences and other residential structures, roads and service lines, and all land between them does not exceed 4,000m^2.

ALC Policy #24 – Additional Residences for Farm Help Accommodation provides additional interpretation as follows:

- One single family dwelling allowed on a parcel, unless otherwise approved by the local government as described above.

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- A secondary suite may be constructed that is wholly contained within the single-family dwelling. The suite is not restricted to being occupied by immediate family.
- One manufactured home may be placed on a parcel, up to 9 metres wide (i.e. "double-wide trailer"), which may be occupied by the owner's immediate family only. If the manufactured home is no longer occupied, it must be removed.
- Alternately, a single-level dwelling may be constructed on top of an existing single-level farm building. (Only one manufactured home or one single-level addition to an existing farm building may be constructed on a parcel, not both.)
- In Zone 2, where a second stand-alone single family dwelling is constructed on a parcel of at least 50 ha, there is no limit on the footprint of the first single family dwelling on a parcel, if a second single family dwelling were built, the total footprint of all residential could not exceed 4,000m^2.

Local Government Act (LGA) and Minister's Bylaw Standards

As set out in Section 479 of the LGA, local governments have significant powers to set land use and zoning bylaws to regulate the density, siting, size and dimensions of farm buildings, and their location on the land. Most local governments and Regional Districts send temporary farm worker housing requests to the ALC for a decision; however, some municipalities are taking more control of the issue through their policies and zoning. For example, see Delta Bylaw No 6798 and City of Kelowna Guidelines for Approval of an Additional Dwelling for Farm Employee and Process for Determining the Need for an Additional Dwelling for Farm Employees (attached).

Section 551 (2) of the LGA states that the Agriculture Minister may establish, publish and distribute standards in relation to farming areas for guidance of local governments in the preparation of zoning bylaws. Section 551 (3) states that these standards may differ in different areas of the province. These standards are guidelines only and are not mandatory. Right to Farm (RTF) regulated communities are *expected* to follow these standards and non-RTF regulated communities are *encouraged* to follow these standards (Bylaw_Development_in_Farming_Areas)

Local Governments Tools

Development Variance Permit (DVP)

In cases where local bylaws do not fit a farmer's need, an application to a local government for a Development Variance Permit or an appeal to the Board of Variance could be made.

Rezoning Application

Use (e.g. single family housing to multi-family housing) or density changes (e.g. one dwelling to 27 dwellings) would require a rezoning application to the local government.

Official Community Plans (OCP)

Section 475 (4) of the LGA:
If development might affect agricultural land, the local government must consult with the ALC.
Section 477(3)(b) of the LGA:
If a local government prepares an OCP and it applies to land in the ALR, they must refer the plan to the ALC for comment.

Temporary Use Permit (TUP)

An Official Community Plan could be amended by bylaw to create areas where Council could consider issuance of Temporary Use Permits for farm worker housing. This is done pursuant to the Local Government Act, Section 492. This designation would then allow a farmer to make an application for the proposed worker housing as a Temporary Use Permit which is valid for three years with a renewal application process.

Restrictive Covenant
The owner of a property on which Farm Worker Housing (FWH) is located can register on the title of that lot a restrictive covenant under s.219 of the *Land Title Act*, stating that: (1) FWH will be removed if it is no longer being occupied by the approved user for a period of x years (2) Removal shall constitute the following: - In the case of a manufactured home or trailer, removal from the lot - In the case of a residential conversion structure, removal from the lot or conversion to a permitted use 3. If the Owner does not remove or decommission the FWH, the cost of removal or decommission will be recovered by x (municipality) in the same manner as it would be able to collect unpaid Municipal taxes.

Other requirements
In addition, a number of other requirements exist that indirectly impact housing, regardless of whether it is on the ALR. Notably, these include the Industrial Camps Regulation (ICR) as well as the federally-managed Temporary Foreign Worker Program, which operates under the authority of the *Immigration and Refugee Protection Act* and Regulation.

Summary:

- The Strengthening Farm Unit (Gregory Bartle) has been working with Central Okanagan Regional District and member municipalities, including Kelowna, to come up with a consistent approach to FWH across the region. Also, Kelowna is a regulated community and therefore any bylaws which restrict or prohibit the use of land in the ALR for a farm business will require approval of the Minister.
- There is no ability of the land owner to go directly to the ALC as the application cannot proceed to the ALC unless it is forwarded by recommendation of council under s.25(3) of the ALCA. Typically, the applicant can reapply to the local government within a specified period of time (6 months to a year).
- Local governments have significant powers to set land use and zoning bylaws to regulate the density, siting, size and dimensions of farm buildings, and their location on the land. These bylaws can vary across the province depending on the particular areas' needs.
- A TUP, covenant, DVP or rezoning are other local government tools to establish criteria for FWH.
- The LGA states that the Agriculture Minister may establish, publish and distribute standards in relation to farming areas for guidance of local governments in the preparation of zoning bylaws (Minister's Bylaw Standards). These standards are meant to influence local government bylaws but are guidelines only and are not mandatory.
- ALCA and the regulation do not set a limit on the number of additional residences for farm help accommodation per parcel, but all residences must be *necessary for farm use*. The interpretation of *necessary for farm use* is left to the local government and the ALC to determine. In some cases, a non-farm use approval is necessary.

Contact: Emily Shaw, Corporate Governance, Policy and Legislation 250 387-3232
Brenda Lennox, Innovation and Adaptation Services Branch 250 356-2945

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[1] "Immediate family" is defined in the Regulation as the owner's: parents, grandparents and great grandparents; spouse, parents of spouse and step-parents of spouse; brothers and sisters; and, children or step-children, grandchildren and great grandchildren.

Delta Bylaw No 6798

k) Prior to occupancy of the 'Migrant Farm Worker Housing" and annually thereafter, the operator of the 'Farm' shall deposit a statutory declaration with The Corporation of Delta, verifying:

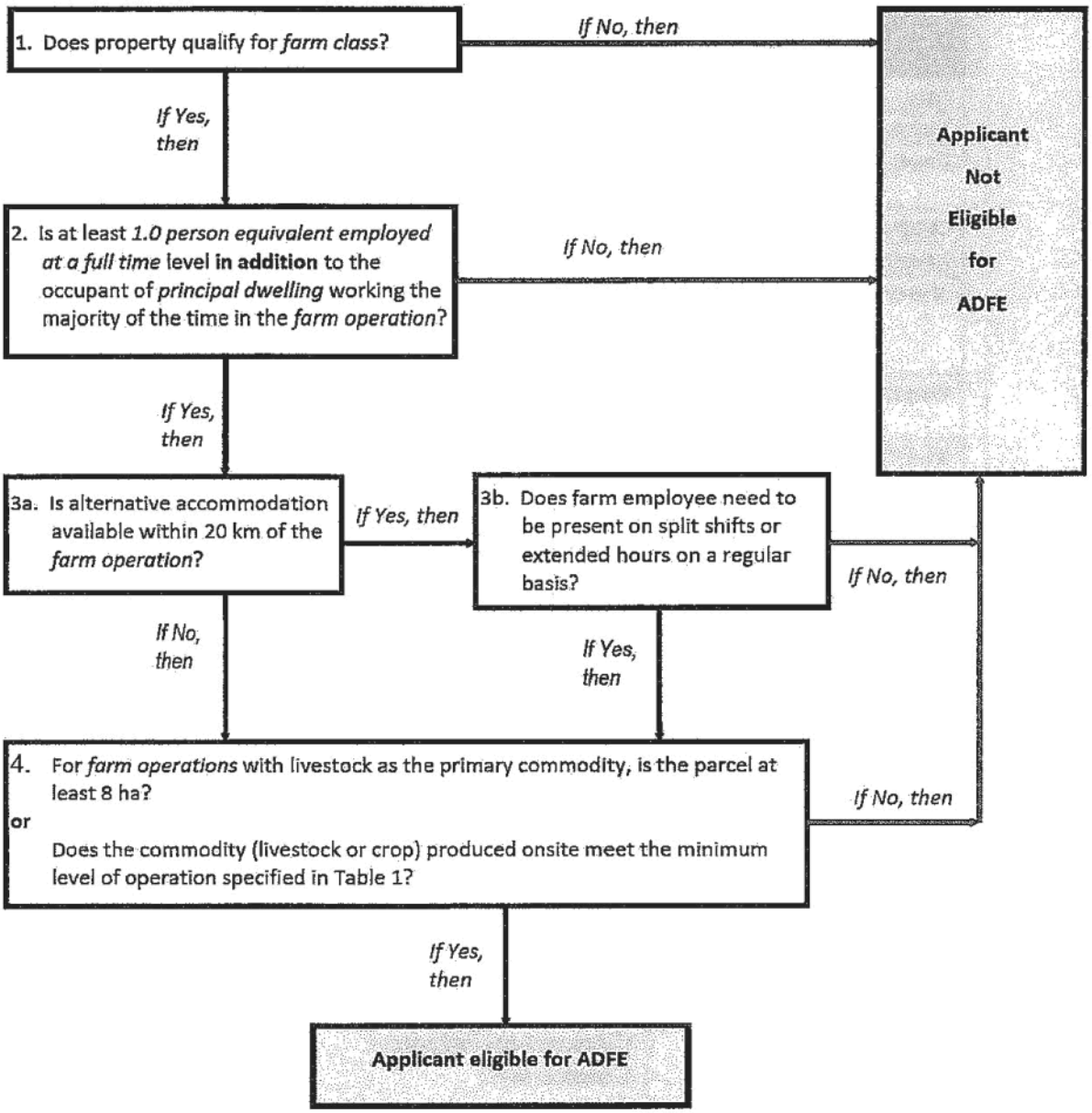
- The dates of proposed occupancy.
- The number of 'Migrant Farm Workers' approved for that farm in an employment confirmation provided through the Federal Migrant Agricultural Farm Worker Program or Pilot Project for Occupations Requiring Lower Levels of Formal Training, as amended or replaced from time to time.
- That the housing complies with all applicable Municipal regulations.
- That the housing has been inspected by an inspector recommended by the Western Agriculture Labour Initiative (W.A.L.I.) and certified as being in compliance with the "Guidelines for the Provision of Housing for Seasonal Agricultural Workers in BC" as amended or replaced from time to time.
- That there is available by telephone twenty-four hours a day, a person who is fluent in English and who may be contacted by phone twenty-four hours a day, to answer enquiries from the municipality as to occupancy of 'Migrant Farm Worker Housing' on the farm.
- The contact information for the appointed person shall be provided in the required annual statutory declaration and updated should it change prior to deposit of the next annual statutory declaration.
- That the 'Migrant Farm Worker Housing' is covered by insurance for the dwelling, and
- That the 'Migrant Farm Worker Housing' shall be occupied only by workers hired through the Federal Migrant Agricultural Farm Worker Program or the Pilot Project for Occupation Requiring Lower Levels of Formal Training for that 'Farm'.

Documentation shall be provided to support the statements made in the statutory declaration.

City of Kelowna
Guidelines for Approval of an Additional Dwelling for Farm Employee
Table 1

Farm Type		Minimum Established Level of Operation
Crops		
Berries		16 hectares harvestable
Forage	Hay-irrigated Hay- dryland	60 hectares 160 hectares
Grapes		10 hectares harvestable
Mushrooms		3,200m^2 of bed area
Nursery	Propagating house Container stock Field grown	4,000m^2 2 hectares 8 hectares
Ornamentals	Field grown Greenhouse grown	8 hectares 6,000m^2
Tree Fruits	Apples/pears/peaches/nectarines cherries	10 hectares 6 hectares
Vegetables	Field grown potatoes Other field crops Greenhouse grown	20 hectares in production 16 hectares in production 20,000m^2
Livestock		
Beef	Cow-calf or grazing	150
Dairy		80
Farmed game	Bison/deer/elk	150
Goats		300
Horses	Breeding Non-breeding	20 Brood mares and 3 standing stallions 40 horses
Llama/Alpaca		60
Pork	Farrow to wean Farrow to finish Finishing	210 150 5,000
Poultry	Chicken broiler Chicken broiler/breeder Chicken layer Turkey Game birds	100,000 per cycle 35,000 per cycle 40,000 per cycle 40,000 per cycle 20,000 per cycle
Sheep	Meat Dairy	400 300

City of Kelowna
Process for Determining the Need for an Additional Dwelling for Farm Employees



Ministry of Agriculture
BRIEFING NOTE FOR MINISTERS FOR INFORMATION

Ref: 184648 **Date:** July 6, 2017

Issue: Update for the Honourable Norm Letnick, Minister of Agriculture and the Honourable Coralee Oakes, Minister of Small Business and Red Tape Reduction on sector growth support for BC's craft beer, spirits and wine industries.

Background:

- Following up on the interest expressed by Minister Letnick and Minister Oakes to identify opportunities to support growth of BC's craft beer sector through economic development programs and services currently offered by government, the Ministry of Agriculture (AGRI) and Ministry of Small Business and Red Tape Reduction (SBRT) met with the BC Craft Brewers Guild (BCCBG) in November 2015 and March 2016 to learn about the challenges facing the sector and provide information on the resources available.
- Subsequently, AGRI and SBRT staff provided Minister Letnick and Minister Oakes with an overview of the support that will be provided to BC's craft beer sector, and further questions were raised regarding the Buy Local resources available to support domestic market development for BC's craft beer, wine and spirits industries.
- AGRI offers a full spectrum of programs and services to support the growth and development of BC's agrifood and seafood sector, from starting a new business and becoming food safety certified to developing long-term strategic export plans and entering international markets.
- To support the growth and development of local markets for BC's agrifood and seafood sector, the BC government has invested $8 million in the Buy Local Program, including $2 million in Budget 2016. The program supports food security in BC and helps BC farmers and food processors promote their local agrifood and seafood products through buy local initiatives.
- BC agrifood and seafood businesses and organizations, including those from BC's craft beer, wine and spirits sector, can apply to the Buy Local Program for up to $75,000 in matching funding for projects that promote local foods that are grown, raised, harvested, or processed in BC. Projects can include in-store promotions, social media or web campaigns, traditional advertising or other eligible market development activities that will contribute to increased sales. Activities must be new to the applicant to be eligible for funding (i.e. an annual consumer-focused event, such as a local beer or wine festival, would be ineligible unless the applicant is requesting funding for a new sub-activity within the event). Tradeshows and events targeting commercial, institutional and food service buyers are ineligible; only consumer-focused activities are eligible for cost-share.

Discussion:

Craft Beer

- BCCBG intends to apply to the Buy Local Program for funding to support activities during Craft Beer Month in October, but has not yet submitted an application. AGRI connected with BCCBG in late June about their proposed activities and informed them about the strong demand for funding and the possibility that further delay in their application may result in them missing the opportunity to acquire funds this year. BCCBG is currently working on an application for funding support.
- Due to the limited staff capacity within BCCBG, their efforts to date have been primarily focused on trying to address the regulatory and policy barriers they have identified as the sector's key challenges for growth (i.e. wholesale liquor pricing models; craft beer sales in grocery stores; etc.).
- The focus of AGRI and SBRT engagement with BCCBG in November 2015 and March 2016 was to help BCCBG understand some of the programs and resources that are currently available from government to help support sector growth. This meeting included a discussion about the important role that BCCBG can

play in communicating government programs and resources to their membership, and how other industry associations have been successful in leveraging these programs to capitalize on growth opportunities in domestic and international markets (i.e. wine, blueberries, and seafood). AGRI has supported the growth of individual craft beer companies through these programs, and is now working directly with the BCCBG to facilitate a program relationship with the industry as a whole.

- BCCBG expressed a need to better understand the long-term growth opportunities for their sector and develop a strategic market development plan that clearly outlines how BC's craft beer sector should position and prepare itself to effectively capitalize on these opportunities. AGRI and SBRT are now working closely with BCCBG to undertake market research and develop a Long-Term Market Development Strategy for BC's craft beer sector by March 2017. Increasing the capacity of the sector to identify long-term growth opportunities and communicate their collective market development priorities in domestic and international markets will enable government and industry to support longer-term projects that facilitate sustainable, consistent growth. This project will be supported by Growing Forward 2 Market Intelligence funding (approximately $50-60k), and delivered by a qualified consultant that will be identified by AGRI and SBRT through a Request for Proposals (closing July 7, 2016). AGRI and SBRT will evaluate the proposals together to identify the successful proponent, and research and industry outreach will begin in August.
- In November, BCCBG also expressed interest in working with SBRT to conduct a business process mapping project which focused on developing a better understanding of the service delivery and regulatory requirements of the craft beer sector. The business process maps developed provided a visual representation of the touch points and complexities of operating within the sector, demonstrating the current state of government requirements (federal, provincial, municipal) for regulations, permits and licenses with which brewers must comply. The BCCBG has received copies of the business process maps and is currently considering next steps.

Wine

- The BC Wine Institute (BCWI) and Canadian Vintners Association (CVA), in partnership with the Winery Association of Nova Scotia, Wine Marketing Association of Ontario and Vignerons Independants du Quebec, are working collaboratively to support a "Wine Regions of Canada" themed showcase at the 39th Vancouver International Wine Festival (VIWF) from February 11-19, 2017.
- VIWF attracts some of the biggest wine industry names from around the world and is firmly established as one of North America's premier wine events. It features wine tastings and pairings, gourmet dinners and luncheons, educational seminars and culinary competitions. Each year, winery principals (winemaker, proprietor, senior executive) representing 155-170 wineries from 14-16 countries travel to Vancouver to pour and discuss their wines at approximately 50 events over eight days. The 2016 festival had 25,000 attendees and participants. Each year, this international festival shines the spotlight on one country or region; in 2017, the focus will be on Canada.
- During the International Festival Tastings at the Vancouver Convention Centre, 700-750+ wines from around the world will be available for sampling. The theme country or region has a special section of the tasting room, showcasing their wineries and style. The room also features regional tasting stations, food suppliers and industry exhibitors, including media and suppliers. Included in the price of each ticket is the opportunity to shop at the onsite BC Liquor Store where all wines served at the International Festival Tastings are available for purchase.
- Since inception in 1979, the festival has raised $8.5 million for the performing arts in Vancouver. Since September 2012, the charitable partner has been Bard on the Beach Theatre Society. Over the past three years, the festival has raised more than $400,000 for Bard.
- VIWF organizers recently shared a high-level proposal with regards to how provincial and federal partners could support the festival, including opportunities for senior government officials to speak at some of the seminars, media receptions and dinners. AGRI and SBRT met with the BCWI and CVA on June 30, 2016 to discuss this proposal and identify potential opportunities for government to help promote BC's wine industry during the festival by supporting the Wine Regions of Canada showcase. BCWI and

CVA are very receptive to the idea of partnering with government to raise the profile of BC wines, and suggested three options for how this could be accomplished:

1. Providing funding to CVA to support the Wine Regions of Canada showcase, which would provide government with speaking opportunities and funding recognition;
2. Hosting a small side event specifically focused on BC wines, where local BC wines could be showcased to key buyers; or,
3. Hosting a larger side event focused on BC seafood and wine, where local BC wines could be paired with local seafood (or other agrifood products) and showcased to key buyers.

- No government funding sources have yet been identified to support any of these proposed initiatives.
- AGRI is also working closely with the BC wine industry and the BC Wine Authority (which regulates wine quality and origin regulations) to implement recommendations for updated and improved regulations.

Spirits

- The BC Craft Distillery Association (BCCDA) represents registered independent craft distilleries in BC and has set a mandate to collectively establish and promote industry values, ethics and policy that are essential for the growth and innovation of BC's craft distilling industry. BCCDA has six members, one associate member and two affiliate/trade members.
- AGRI and SBRT have not yet engaged with the BCCDA to share information on the economic development programs and resources available for their members, but have engaged with and supported individual craft distilleries through the Canada-BC Agri-Innovation Program and government-led international tradeshow initiatives.
- BC Distilled is the only high-profile event in BC focused on the craft spirits sector. BC Distilled 2016, held on the evening of March 26, provided local consumers with an opportunity to taste craft spirits from 27 distilleries. Information is not yet publically available on the 2017 event.

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Contact: Mat Patterson, Innovation & Adaptation Services Branch, 250-356-0191

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Ministry of Agriculture
BRIEFING NOTE FOR MINISTER FOR INFORMATION

Ref: 184673 Date: July 6, 2016

Issue: Release of regional agricultural adaptation strategy for the Okanagan.

Background:

For BC producers, climate change will result in increased management complexity, business costs, and uncertainty due to impacts such as drought, excess moisture, flood risk, and pests and diseases. There will also be an increase in growing days and opportunities for new crops. Successful adaptation will be required for the industry to manage the risks and take advantage of the opportunities.

The Ministry of Agriculture (Ministry) is working with industry, local governments and other partners to increase the capacity of BC farmers to adapt to climate change. This program is supporting development of regional adaptation strategies in key agricultural areas of BC and providing support for the piloting and demonstration of innovative adaptation practices on BC farms and ranches. The program is funded through the federal-provincial-territorial Growing Forward 2 (GF2) initiative, is industry-led, and is delivered by the BC Agriculture and Food Climate Action Initiative (CAI).

CAI was set up by the BC Agriculture Council in 2008 to assist the agriculture sector in addressing the challenges, and acting on the opportunities, associated with climate change. CAI has an advisory committee of agricultural producers, food processors and representatives from government agencies (Ministry of Agriculture, Ministry of Environment, and Agriculture and Agri-Food Canada). In 2011-2012, CAI completed a province-wide assessment of climate change-related risks and opportunities for the agriculture sector. The assessment concluded that a regional approach to climate change adaptation is required, due to BC's diverse agriculture, ecology and climate.

CAI has completed regional adaptation strategies for Delta (2013), the Peace Region (2013), Cowichan Valley (2013), Cariboo (2014), Fraser Valley (2015), and the Okanagan (2016, attached). The regional adaptation strategies are developed in collaborative partnership with local governments, local agricultural organizations, provincial and federal agencies, and climate science experts. Each strategy identifies the priority climate impact areas and a series of actions to address those impacts. Up to $300,000 in GF2 funding is available to regional partners to implement the regional strategy actions.

In the Okanagan region four priority impact areas were identified:

1. warmer and drier summer conditions;
2. changes in pest populations;
3. increase in extreme precipitation events, and
4. increase in wildfire risk.

Projects to address these priority impact areas in the Okanagan will be developed and delivered over the remainder of GF2, concluding March 2018.

Discussion:

Successful adaptation to climate change will be necessary for the agrifood sector to continue to grow and be an important contributor to the BC economy. Government and the agriculture industry have both made adaptation a priority, and are working in partnership to build resilience and adaptive capacity in the sector.

The collaboration and support from agricultural producers, agricultural organizations, local governments and other partners is fundamental in the success of the Ministry's climate adaptation programming.

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The Okanagan regional strategy was completed with the input and assistance of the following groups:

- Agriculture and Agri-Food Canada
- BC Cherry Association
- BC Fruit Growers' Association
- BC Wine Grape Council
- British Columbia Grapegrowers Association
- Central Okanagan Regional District
- Certified Organic Association of BC
- Okanagan Basin Water Board
- Regional District of North Okanagan
- Regional District of Okanagan-Similkameen
- Southern Interior Stockmen's Association

The BC Agrifood and Seafood Growth Plan identifies climate change as a key driver for the agriculture sector and highlights the Ministry's commitment to continue supporting programs that enhance BC's producers' ability to adapt to climate change.

The regional adaptation strategies are acknowledged as the most advanced work of this type in Canada. Agriculture and Agri-Food Canada has recently made significant funding available for provinces to undertake risk and opportunity assessments similar to those undertaken in BC by CAI.

The Ministry is actively participating in provincial and federal initiatives that relate to climate action, including:

- BC Climate Leadership Plan,
- Pan-Canadian Framework for Clean Growth and Climate Change, and
- Development of the next federal/provincial policy framework for agriculture (2018 - 2023), and the inclusion of a strong focus on climate adaptation.

Next Steps:

- Work with GCPE and CAI on the public release of the Okanagan regional adaptation strategy.
- CAI will work with local partners to develop collaborative projects based on the actions identified in the strategy.

Contact:
Brenda Lennox, A/Executive Director, Innovation and Adaptation Services Branch (250) 356-2945
Ian McLachlan, Manager – Climate Action, Innovation and Adaptation Services Branch (250) 356-1852

Attachment: Okanagan Regional Adaptation Strategy (2016)

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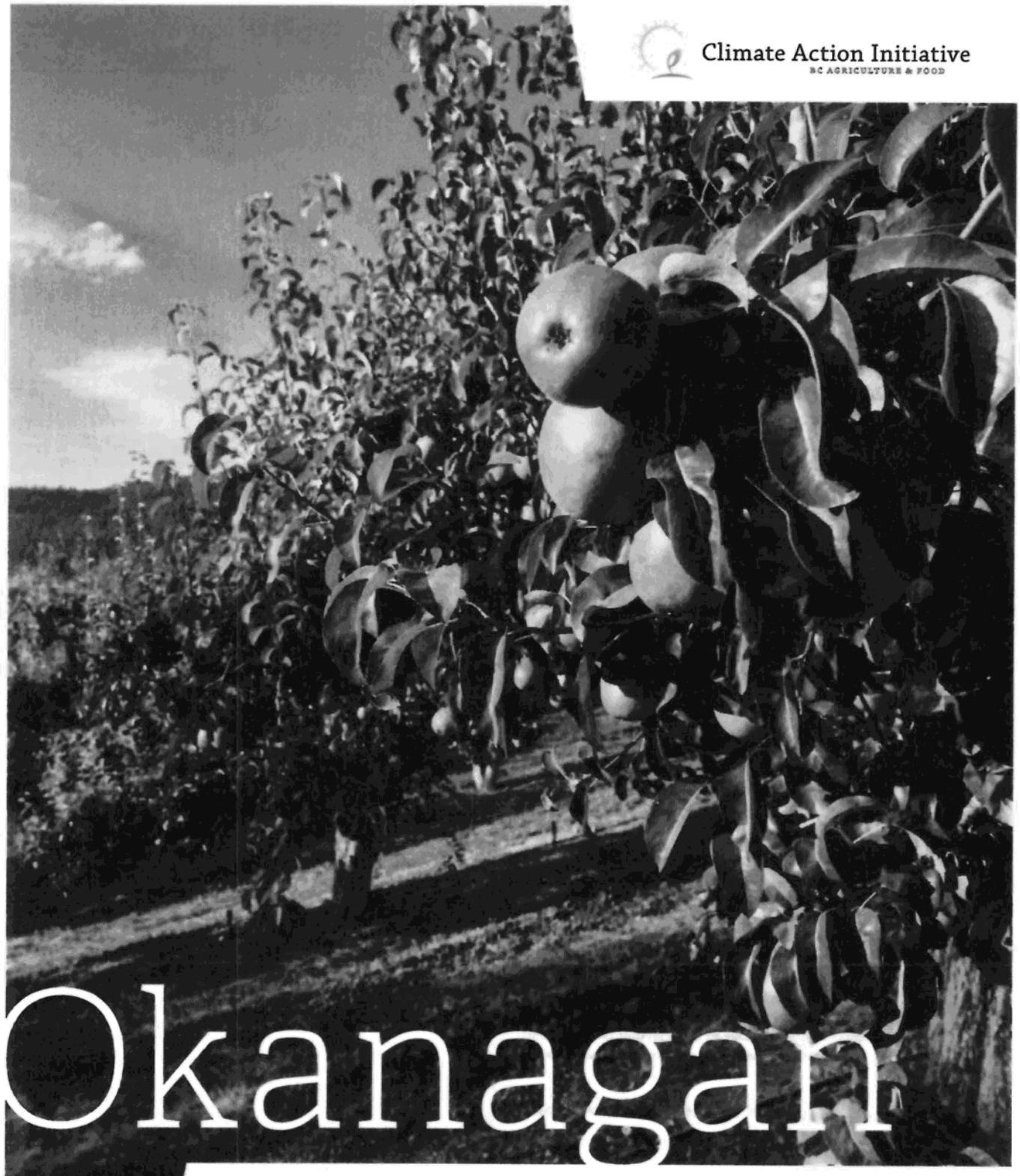

Climate Action Initiative
BC AGRICULTURE & FOOD

Okanagan

BC Agriculture & Climate Change
Regional Adaptation Strategies series

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and BC Ministry of Agriculture
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and
Regional District of Central Okanagan
Regional District of North Okanagan
Regional District of Okanagan-Similkameen

other project partners
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Agriculture & Food
Climate Action Initiative

The BC Agriculture & Food Climate Action Initiative was established by the BC Agriculture Council in 2008, and is led by an advisory committee of agricultural producers, food processors and representatives from various government agencies. The Initiative has been supported by the Investment Agriculture Foundation of BC with funding provided by Agriculture and Agri-Food Canada and the BC Ministry of Agriculture.

The Regional Adaptation Enhancement Program is part of the BC Ministry of Agriculture's ongoing commitment to climate change adaptation in the agriculture sector while enhancing sustainability, growth, and competitiveness.

www.BCAgClimateAction.ca

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Climate Action Initiative
BC AGRICULTURE & FOOD

Acknowledgements

The *Okanagan Adaptation Strategies* planning process was initiated by the BC Agriculture & Food Climate Action Initiative to address priorities identified through both the *Climate Change Risk & Opportunity Assessment* and the *BC Agriculture Climate Change Action Plan* (both available at *www.bcagclimateaction.ca*).

Thank you to the North Okanagan Regional District, the Central Okanagan Regional District and the Regional District of Okanagan-Similkameen, and to the agricultural organizations that supported, and contributed to the success of, this project.

The development of the *Okanagan Adaptation Strategies* involved contributions from many people, including 117 individual participants who took the time to attend one, two, or all, of the project workshops. A special thank you to the agricultural producers who volunteered their time to come together and consider adaptation priorities and to provide their expertise and input.

Thank you to the project Advisory Committee members in the Okanagan region who participated in Committee meetings and attended the workshops. The project could not have been successfully completed without their valuable insights, assistance and input throughout the process.

Thank you to:

- *Erin Carlson*, BC Cherry Association
- *Paddy Doherty*, Certified Organic Associations of BC
- *Laura Frank*, Regional District of North Okanagan
- *Nelson Jatel*, Okanagan Basin Water Board
- *Denise MacDonald*, BC Fruit Growers' Association
- *Denise Neilsen*, Agriculture and Agri-Food Canada
- *Graham O'Rourke*, British Columbia Grapegrowers Association
- *Evelyn Riechert*, Regional District of Okanagan-Similkameen
- *Theo Siemens*, BC Wine Grape Council
- *Anne Skinner*, BC Ministry of Agriculture
- *Janelle Taylor*, Central Okanagan Regional District
- *Brian Thomas*, Southern Interior Stockmen's Association

Thank you to the *Pacific Climate Impacts Consortium* at the University of Victoria for providing the regional climate data and assistance with data interpretation.

Cover photograph by Emrys Damon Miller.

Contents

Introduction

In the coming years, climate change will impact the agriculture sector in British Columbia in a range of different ways.

Although agricultural producers are accustomed to adjusting their practices to manage through difficult conditions, the scope and scale of climate change is anticipated to exceed anything previously experienced. Strategies and actions that will enhance agriculture's ability to adapt to climate change are the focus of this plan.

In 2011–2012, a province-wide assessment of climate change-related risks and opportunities evaluated the potential impacts of climate change on agricultural production and the sector's capacity to adapt.[1] The assessment made evident that, due to British Columbia's diversity (with respect to agriculture, ecology and climate), a regional approach to climate change adaptation is required. In addition, while some adaptation will occur at the farm level, the context beyond the farm and collaborative approaches are critical for supporting agricultural adaptation.

Building on these findings, in 2012–2013 a pilot project was initiated with agricultural producers, agricultural organizations and local governments in Delta and the Peace River and Cowichan Valley regions. Each planning process resulted in a distinctive set of local sector impacts and priorities, as well as a series of strategies and actions for adapting and strengthening resilience. The plans are intended to offer clear actions suited to the specifics of the local context, both with respect to anticipated changes and local capacity and assets.

Following completion of the pilot, in 2013–2014 the *Regional Adaptation Enhancement Program* was launched. The Program is delivered by the BC Agriculture & Food Climate Action Initiative (CAI) and is part of the BC Ministry of Agriculture's Growing Forward 2 programming. Since the Program's inception, additional adaptation plans have been completed for the Cariboo region (2014), the Fraser Valley region (2015), and now the Okanagan region.

Once regional adaptation plans are completed, up to $300,000 in Growing Forward 2 funding is available to regional partners (working with the CAI) to develop and implement collaborative priority projects. Implementation is underway in five regions and details are available at *www.bcagclimateaction.ca*.

Project Delivery

A local Advisory Committee for the Okanagan region was formed to provide input throughout the project. This Committee included participants from the three regional districts in the Okanagan, the BC Ministry of Agriculture, Agriculture and Agri-Food Canada (AAFC) and a number of agricultural organizations. The agricultural producer participants volunteered their time throughout the project, representing five distinct local production systems. The regional district partners provided staff time and expertise and covered costs associated with the workshops.

With funding from Growing Forward 2, the BC Agriculture & Food Climate Action Initiative provided core management and human resources for project delivery. Please see Acknowledgements for more details.

Project Methodology

The development of the Strategies involved three key stages:

1 *Project Development*
A project plan was drafted and background research was conducted through a review of relevant documents and related activities. Ten preliminary meetings were held with producer organization and local government staff, to discuss local issues and priorities. Two initial meetings were held with the local Advisory Committee to receive input on the project outline and the proposed approach for the first workshop.

2 *Workshops*
Two sets of workshops were held (each set held in two locations — Penticton and Vernon) for a total of four workshops. The first set of workshops focused on reviewing climate change projections, discussing the associated agricultural impacts and identifying priority areas of risk. Developing strategies and actions for adapting to these priority areas then became the focus of the second set of workshops.

Prior to the second set of workshops, a series of overarching goals, strategies and sample actions was developed and reviewed by the Advisory Committee. These materials provided support for the workshop action planning process (which also incorporated consideration of local priorities, context and resources). 117 individual participants attended one or both of the project workshops.

3 *Implementation Meeting*
An implementation meeting was held with 26 participants representing many of the key local partners. The meeting involved prioritization of draft actions based on which were most important, which were easiest to implement and which would support enhancement of capacity for additional adaptation. The meeting also included discussion of steps to implement prioritized actions.

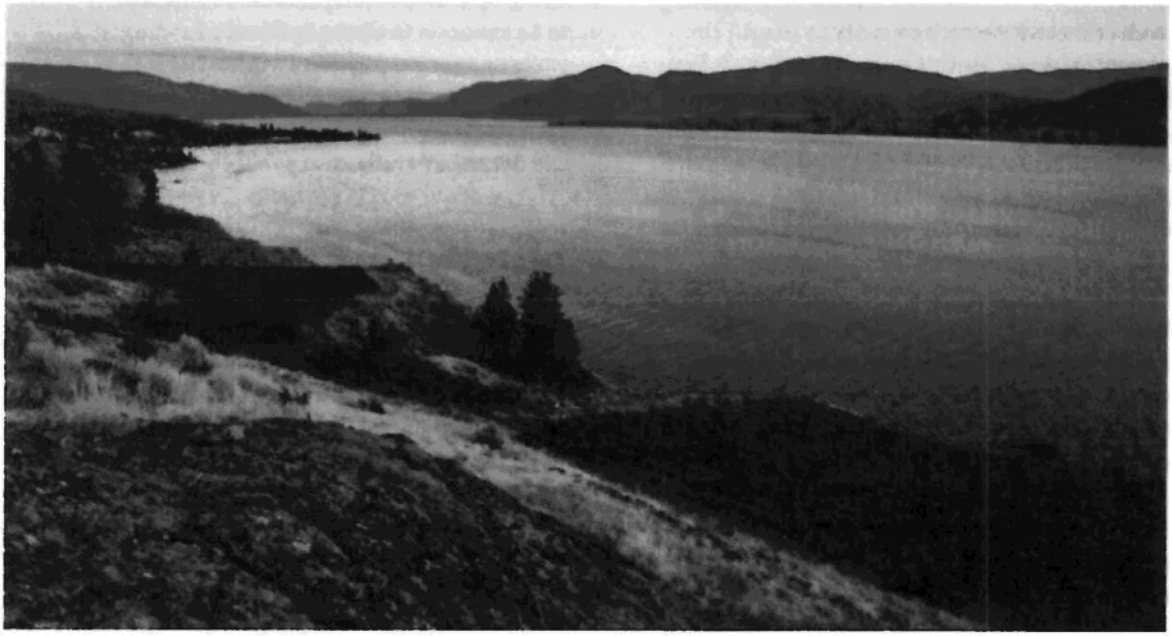

photo by Emrys Damon Miller, vineyards in Naramata

Regional Context

Geography, Climate & Production Capacity

The geographic scope of the Okanagan Adaptation Strategies includes the Regional District of North Okanagan (RDNO), the Regional District of Central Okanagan (RDCO) and the Regional District of Okanagan-Similkameen (RDOS). This area is located between the Columbia and Cascade mountain ranges in south-central British Columbia and covers a total area of 20,822 square kilometres.[2]

Within these three regional districts there are sixteen municipalities and fifteen electoral areas.[3] There are also eight member communities of the Okanagan Nation Alliance.[4] The combined population of the RDNO, RDCO and RDOS is 341,818.[5] The Okanagan region contains the largest concentration of population in the province's interior (7.8% of BC's total population).[6]

The Okanagan region has a warm growing season with high accumulations of growing-degree days and

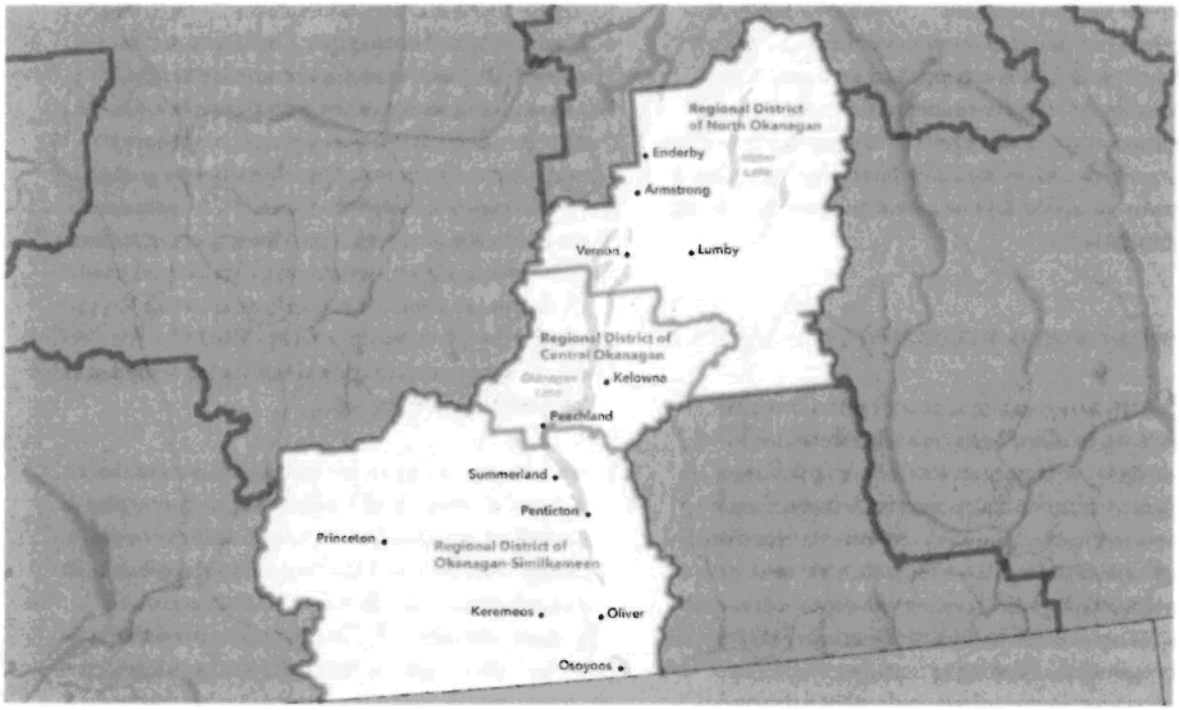

FIGURE 1 Map of three Okanagan regional districts

sunshine-hours, as well as relatively mild winters and springs characterized by long frost-free periods.[7] The Okanagan region lies in the rain shadow of the Coast and Cascade mountains, creating a hot, sunny, dry climate that is classified as semi-arid, with the lowest average (annual) precipitation in southern Canada.[8]

Precipitation in the Okanagan region ranges from an average of 250 mm per annum in the drier, southern part of the region to 400 mm per annum in the northern part of the region and at higher elevations.[9,10] In general, it is cooler and the growing season is shorter in the northern part of the region.[11] The lack of adequate growing season precipitation in some parts of the region (in particular at the lowest elevations) is the major climatic limitation for agriculture. Irrigation is required for most production, with the exception of limited early season pasture and forage crops.[12]

Soil types and agricultural capability vary across the region and by elevation.[13] It is estimated that there are 31,160 hectares (77,000 acres) of arable land in the Okanagan Basin.[14] The majority of agricultural land is adjacent to Okanagan Lake and some of its tributaries. There are also portions of the Agricultural Land Reserve (ALR) to the north of Okanagan Lake and surrounding Princeton.[15] Five major soil groups exist within the Okanagan Basin.[16] There are widespread differences in soil types throughout the Basin; the southern part of the Basin has deep sandy soils, whereas the northern area around Kelowna is mainly composed of clay and gravel.[17] Unimproved soils are Class 4 or 5 due to aridity and topography, but soils can be improved to Class 1, 2 or 3 depending on the severity of limitations.[18]

Economic & Institutional Context

In addition to region's climatic and environmental advantages, the Okanagan region is located in proximity to large markets and has well developed transportation infrastructure and educational and research institutions. Linkages between tourism and agriculture are strong in the region. Direct farm gate sales to visitors are an important source of income for some operations, along with other diversification opportunities afforded by agri-tourism.[19] The Okanagan region contributed 12% of total provincial gross farm receipts in 2010, generating over $355 million.[20] In 2011, there were 10,740 farm workers employed in the Okanagan; this was 24% of the provincial total of agriculture sector employees, working on only 3.6% of the province's Agricultural Land Reserve.[21]

Land prices are high in the Okanagan region, largely due to the rate of residential development. The high price of farmland limits expansion, renovation and investment in farming.[22] However, opportunities do exist for entrants from other locations around the globe with similar land prices.[23] Up until recently, the wine grape industry has continued to attract new entrants but has struggled to secure qualified labour.[24]

The Regional District of Central Okanagan (2005) and the Regional District of North Okanagan (2015) have both completed Agriculture Area Plans and have Agricultural Advisory Committees (AAC) in place to guide plan implementation, and to review land use applications and other planning decisions that may affect agriculture. Many regional district member municipalities have also completed agriculture plans and established AACs.

The three regional districts had partnered on various initiatives before jointly contributing to this plan. RDNO, RDCO and RDOS are currently partnering on the Okanagan Kootenay Sterile Insect Release Program,[25] and each region is represented on the Okanagan Basin Water Board. Starting in 2015, the three regional districts began a project to identify, monitor and evaluate common indicators pertaining to their Regional Growth Strategies.[26] The regional districts also contributed to the Ministry of Agriculture Agricultural Land Use Inventory (ALUI), which has been used as input for the Agriculture Water Demand Model for the Okanagan Basin (AWDM). The AWDM is used to determine current and future water demands for agriculture in the region.[27]

There is a long history of agricultural research in the Okanagan, with tree fruit breeding and variety trials underway as early as 1914.[28] Research facilities in the region include: the (AAFC) Summerland Research and Development Centre, UBC Okanagan and Okanagan College.[29] The Okanagan Basin Water Board and the Okanagan Water Stewardship Council are spearheading research around water resources and management. A number of commodity-specific

industry associations and organizations representing members' interests are based in the Okanagan. These groups provide a broad range of services for their members, including marketing, research and informational resources, and program delivery.[30]

Agricultural Production

Only 8.5% (176,692 hectares) of the Okanagan region's overall area is included in the Agricultural Land Reserve.[31] There are 3,693 farms in the region (19% of farms in BC) and the average age of producers is 56.[32] The agriculture industry grew steadily in the Okanagan between 2001 and 2011. The total amount of land farmed in 2011 was 199,765 hectares, an increase of 10,699 hectares from 2006, and an increase of 26,224 hectares from 2001.[33] The average farm size in the Okanagan is 54 hectares, significantly lower than the province-wide average of 132 hectares.[34] 53% of the farms in the Okanagan are under four hectares.[35]

photo by Emrys Damon Miller, Okanagan apple orchard

The type of agricultural production is not uniform across the Okanagan region. In the northern areas, forage, dairy and cattle ranching are common, while tree-fruit, grape and vegetable production dominate the central and southern areas.[36] Today, 90% of BC's apples, 89% of BC's grapes and 85% of BC's cherries are grown in the south-central Okanagan. In recent years there has been a steady shift away from many types of tree fruit (apples, pears, peaches, plums and apricots), largely due to challenges with profitability.[37] However, in the summer of 2015 the BC Fruit Growers' Association reported a very slight expansion of acreage devoted to apple growing in the Okanagan (after decades of decline).[38] Also, the land in sweet cherry production has increased substantially, from 781 hectares in 2001 to 1,429 hectares in 2011.[39]

As some types of tree fruit production have been shrinking, acreage has been shifting into wine grapes and there are now almost 3,491 hectares in grape production across the region.[40] In the Regional District of Central Okanagan alone, the period between 1991 and 2006 saw a 346% increase in land devoted to grape production.[41] Much of the conversion from orchard to vineyard has been concentrated in the southern portion of the region.[42] Today the Okanagan is one of the largest producers of fruit and wine in Canada.[43]

The north Okanagan has a well-established dairy industry, and its poultry production has also grown in recent years. Field crops, particularly alfalfa but also barley and tame hay/fodder crops are predominant in the north Okanagan, with 17% of the provincial total acreage of winter wheat and 20% of the provincial acreage of forage corn grown in the RDNO.[44] The Okanagan region as a whole contributes significantly to organic production in the province across a range of crops, including fruits, vegetables and greenhouse products. Thirty-nine percent of the province's certified organic farms are located across the three regional districts (with 26% of the province's certified organic farms located in the RDOS). There is also apiculture, greenhouse and nursery production, vegetable and melon farming and sheep/lamb production in the Okanagan region. Many of these production types have experienced growth over the last decade.[45]

Regional Climate Science

An evaluation of adaptation options must be based on the best possible understanding of the nature, magnitude and speed of climate change. Climate scientists began developing computer simulations of the Earth's climate in the 1960s and these models have become increasing sophisticated and refined.[46]

In the past decade, climate scientists have successfully downscaled global climate models to regional scales by taking into account the variability in temperature and precipitation introduced by topography.[47] The Pacific Climate Impacts Consortium (PCIC) is a regional climate service centre at the University of Victoria that provides practical information on the physical impacts of climate variability and change, in support of long-term planning.[48] PCIC was a key partner in developing the regional adaptation strategies that preceded the Okanagan strategy, and has assisted in the production of the agriculturally relevant regional climate projections for the 2020s and 2050s that are presented in this document.

Additional information about regional climate projections, maps, and related definitions may be found in Appendix B and Appendix C, and in PCIC's Thompson-Okanagan climate summary at: *https://www.pacificclimate.org/sites/default/files/publications/Climate_Summary-Thompson-Okanagan.pdf*

Okanagan Regional Climate Projections: 2020s to 2050s

Key climate projections for the Okanagan region in the 2020s to 2050s are summarized here. Projections were generated by PCIC using data available through

Temperature Projections

- Annual average is 1.4°C warmer by 2020s (+2.4°C by 2050s)
- 21 more frost-free days annually by 2020s (+38 days by 2050s)
- 249 more growing degree-days annually by 2020s (+453 days by 2050s)

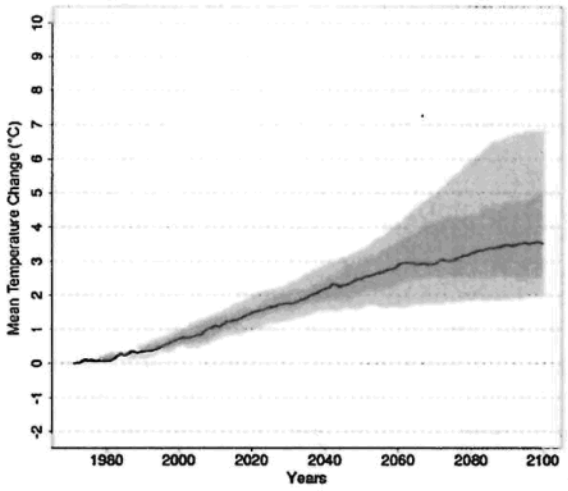

FIGURE 2 Mean Annual Temperature change, 1970s to 2090s

their "Regional Analysis Tool." Numbers provided are the median of all model runs (black line in the graphs), and the shaded area on the graphs shows the range of projected possible future conditions.[49]

Temperature

Projections for key temperature variables show a strong increasing trend, with all models projecting warming in all seasons (see text box and Figure 2, previous page). This trend is significant compared to historical variability, and summer is projected to warm slightly more than other seasons.

Precipitation

While models show the possibility for both increasing and decreasing future annual precipitation, the median annual trend is an increase of 1.2% above the 1990 baseline by 2020, and increasing by 4.4% by 2050.

The majority of models show a decrease in summer precipitation. There may be a slight increase in the amount of winter precipitation, with a marked decrease in the amount falling as snow (see Figure 3).

The distribution of these temperature and precipitation changes is greatly influenced by local geographic settings — temperature by elevation, and precipitation by topography. As Figure 4 shows, temperatures are higher in the valley bottoms of the Okanagan region, with cooler temperatures and wetter conditions around the Okanagan range to the south and the Beaverdell Range to the east. Many agricultural operations in the Okanagan are located in valleys — or on the benches above — and would therefore be affected by the greater temperature increases.

Precipitation Projections

- Annual precipitation: +1.2% by 2020s (+4.4% by 2050s)
- Summer: −8% by 2020s (−9% by 2050s)
- Winter: +6% by 2020s (+9% by 2050s)
- Winter Snowfall: −9% decrease by 2020s (−19% by 2050s)

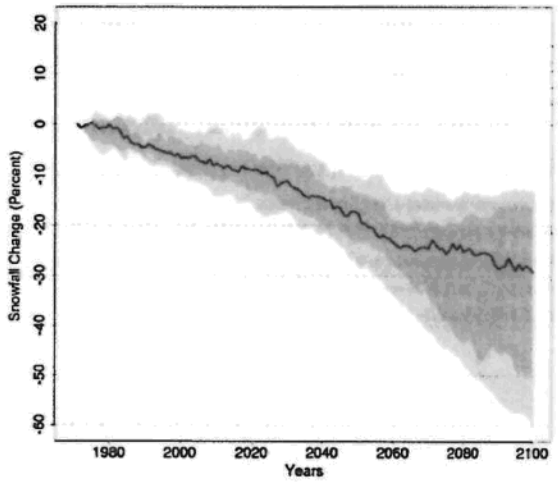

FIGURE 3 Precipitation as Snow, 1970s to 2090s

Related Effects

The magnitude, frequency and intensity of extreme events, for both temperature and rainfall, are also forecast to increase with climate change. Unusually warm temperatures are very likely to occur more often, and cold temperatures less frequently. Projections are for 2.2 times the number of summer "warm days" (days in June, July and August that are warmer than the 90th percentile historic baseline temperature for that day) and 6.8 times the number of extremely hot days (days so hot they used to occur only once every 10 years). The intensity and magnitude of extreme rainfall events are also projected to increase. Detailed projections for 2050s may be found in the Extremes text box on the following page.[50]

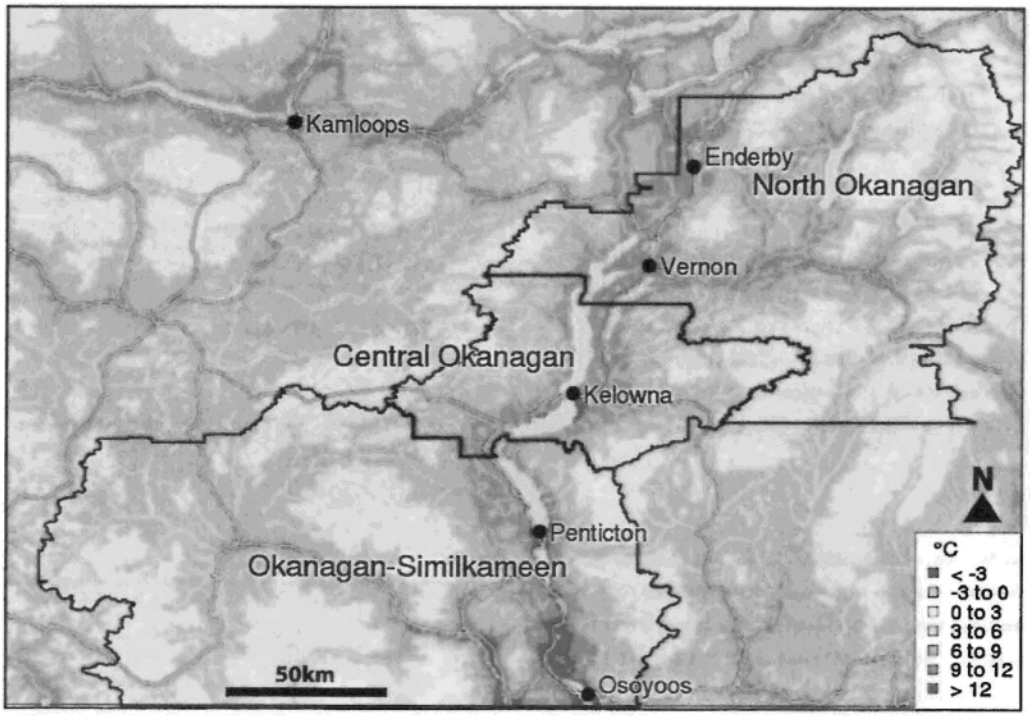

FIGURE 4 Okanagan Region Mean Annual Temperature, 2050s

This map illustrates the spatial distribution of the median value of all models of 2050s mean average temperature. The global model data has been down-scaled to reflect regional temperature variation, driven largely by topography. As temperatures varied historically, so too will they vary in the future, with the mountainous zone to the south and east cooler (yellow-white), and valley zone — where most agricultural lands are located — warmer (red). Note that more local effects, such as vegetation changes and dropping snow elevation, may add to the trend in the valley.

As precipitation in the Okanagan and in upstream areas changes, river systems in the region will likely shift to a more rain-dominated pattern, with less predictability and increased variability in timing and volume of flows. With changes to snowpack and temperatures, runoff peaks are likely to occur earlier in the season, with lower discharge later in the summer.

The projected changes outlined in this section will affect the Okanagan's agricultural sector. The ecological effects and resulting agricultural impacts of these projected climate changes are summarized in the next section.

Extremes

- ***2.2 times*** **the number of summer** ***"warm days"*** (days in June, July and August that are warmer than the 90th percentile historic baseline temperature for that day)
- ***6.8 times*** **the number of** ***extremely hot days*** (days so hot they used to occur only once every 10 years)
- ***Increased*** **frequency, intensity and magnitude of** ***extreme rainfall***
- ***2.4 times*** **the number of** ***extremely wet days*** (days so wet that in the past they would only occur once every 10 years)

Agricultural Impacts

The changes in climate projected for the Okanagan region will have a range of impacts on the agriculture sector. These impacts are summarized in the table immediately below.

TABLE 1 Potential impacts of climate change on agricultural production in the Okanagan region

Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
▪ Increase in average temperatures ▪ Decrease in summer precipitation ▪ Increase in number of warm and extremely hot days ▪ Reduction in snowfall (and associated snowpack)	*Warmer & drier summers:* ▪ More frequent and extended dry periods in summer ▪ Lower summer stream flow levels (more rapid and earlier spring melt)	▪ Reduction in water supply availability ▪ Increase in irrigation demand and draw down of water storage ▪ Impacts to crop yields and quality (particularly non-irrigated crops) ▪ Increase in plant stress/damage ▪ Impacts to livestock health/productivity ▪ Changes to timing and use of rangelands for grazing cattle ▪ Increase in costs associated with water (e.g., water supply infrastructure)
▪ Increase in precipitation in winter ▪ Increase in frequency, intensity and magnitude of extreme rainfall	*Extreme precipitation events:* ▪ Increase in runoff ▪ Potential for more rain-driven flood events ▪ Increase in excess moisture	▪ Increase in risk of soil erosion and landslides ▪ Damage to riparian areas (e.g., erosion, washouts, silting) ▪ Damage to infrastructure (e.g., dams) ▪ Increase in site-specific flood risk and drainage issues ▪ Reduced windows for crop development and seasonal tasks (pollination, planting, germination and harvesting) ▪ Negative impact on crop productivity and quality ▪ Increase in crop damage and losses (e.g., hail storms)

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Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
• Increase in average temperatures • Increase in growing degree days • Increase in frost free days • Increase in minimum winter temperatures	*Changing crop suitability ranges:* • Changing seasonal conditions • Changing production windows	• Increase in suitability of late maturing varieties and decrease in suitability of early maturing varieties • Expansion or relocation of some opèrations northward and to higher elevations • Changes to irrigation needs and possible land use competition • Inconsistent yield and quality of previously suitable crops • Difficulty in identifying suitable varieties for crops with long time horizons as change continues (e.g., tree fruit) *Potential opportunities:* • Increase in suitability for new varieties and new crops • Opportunity for season extension and additional harvest of certain crops
• Increase in annual temperatures • Increase in winter minimum temperatures • Shifting precipitation patterns • Drier summer conditions	*Changes in pests, diseases, invasive species:* • Increasing winter survival rates • Increasing number of cycles in a year • Introduction of new pests and diseases • Changing range/ distribution of pests, diseases and invasive species	• More frequent and increased damage to crops • Impacts to livestock health due to pests/diseases • Reduction in forage quality • Increase in costs for management of pests, diseases, invasive species • Less effective pest models (i.e., pest models calibrated for past climate)
• Increase in average and seasonal temperatures • Increase in extreme weather events	*Increase in extreme heat events:* • Increasing number (and frequency) of consecutive warm and hot days	• Increase in irrigation demand • Reduction in productivity, size and quality of some crops • Increase in crop damage and loss • Increase in some pest and disease damage • Pressure on cooling and storage technologies/ infrastructure (particularly at harvest) • Impacts to livestock health and productivity
• Increase in variability of conditions	*Increasing variability:* • Fluctuating and unpredictable seasonal conditions • Increased uncertainty of frost risk timing (spring/fall)	• Damage to crops and increase in susceptibility to disease • Reduction in productivity and quality • Earlier season for all agricultural activities • Changing labour needs (timing/volume)

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Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
• Increase in average temperatures and extreme heat events • Decrease in summer precipitation (longer, warmer and drier summers)	*Increasing wildfire risk:* • More frequent and intensive wildfire events	• Damage and losses to agricultural assets and infrastructure • Loss of production and decrease in quality (e.g., due to smoke) • Impacts on livestock health • Reduction in agri-tourism • Increasing costs associated with preparing for, managing and responding to wildfire • Impacts on agricultural water supply (competing use for fighting fires)
• Increase in average temperature • Increase in average precipitation	*Changing ecosystems & wildlife populations/ distribution*	• Increase in pressure on agricultural lands from distribution of deer, elk, wild sheep and other species • Impacts to grazing areas in northern Okanagan from wolf populations • Increasing challenge with maintaining environmental flows (and potential impacts on agricultural water)

This set of "impact areas" (groupings of projected climate changes and their associated effects and agricultural impacts) formed the basis for discussions at the first set of workshops. These impact areas were explored in detail with participants, and ranked in order of importance for both the individual farm and regional level. Based on this input, the highest priorities were identified and some impact areas in the table above were excluded from consideration at the second workshops. Those impacts that were excluded may prove to be problematic or advantageous in the Okanagan region in the future, and should continue to be monitored. Adaptation strategies may still be needed for agriculture to address excluded impact areas.

Priority Impact Areas, Strategies & Actions

The following four impact areas were identified as the highest priorities with respect to agricultural adaptation in the Okanagan region:

- **Impact Area 1**
  Warmer & drier summer conditions
- **Impact Area 2**
  Changes in pest populations[51]
- **Impact Area 3**
  Increase in extreme precipitation events
- **Impact Area 4**
  Increasing wildfire risk

For each of the priority impact areas, background description and adaptation goals are included. Following the description are the strategies and actions to support the Okanagan region agriculture sector with adapting to climate change.

The strategies and actions presented were developed to:

- Address the highest priority impact areas
- Reduce vulnerability to these impacts, and/or build capacity to adapt and respond to these impacts; and
- Define practical steps forward that address gaps and build on existing assets in the Okanagan region context.

Following the strategies and actions, the final section highlights those actions identified for near-term implementation. Implementation details, key participants, timeframes and cost ranges are provided for these near-term priority actions.

stock photo (iStock)

Impact Area 1: *Warmer & drier summer conditions*

The Okanagan Basin relies entirely on local precipitation (in the form of rain and snow) to replenish its streams, rivers, highland reservoirs and lakes.[52] With climate change, the Okanagan will experience an overall increase in average annual temperature, along with warmer winter temperatures, which will lead to a decrease in snowpack and earlier peak stream flows. Snowmelt generated run-off is the most significant determinant of the timing and amount of water available in the Basin, resulting in an increased risk of water supply disruption under climate change.[53]

Relevant Climate Change Effects

- Increasing annual and seasonal temperatures
- Increasing number of summer warm days and extremely hot days
- Decreasing snowfall
- Decreasing precipitation in the summer

Okanagan summers are also anticipated to become warmer and drier. Surface water constitutes two-thirds of the Okanagan Basin's total water supply and is an important contributor to water supply during the summer.[54] This source is particularly vulnerable to impacts from prolonged drought.[55] The Okanagan region experienced a Level 4 drought during the summer of 2015, creating the potential for regional water managers to take regulatory actions (such as temporary suspension of water licences) if this had been deemed necessary.[56] The region also experienced droughts during the summers of 2003 and 2009.[57] The 2003 drought forced the District of Summerland to declare a state of emergency.[58]

While water supply is being adversely impacted by climate change, water demand is expected to increase, partly driven by greater irrigation needs due to hotter and drier conditions.[59] Surface water sources supply 75% of the 18,416 hectares of irrigated agricultural land in the Okanagan.[60] About 21% of irrigated agricultural land draws on groundwater and the remaining 4% relies on reclaimed water.[61] For Okanagan producers, ensuring access to sufficient water for irrigation and livestock was a primary concern during the *Adaptation Strategies* workshops.

An important tool for managing water scarcity is drought planning. Drought planning is currently gaining momentum in the region, with the Okanagan Basin Water Board providing facilitation and support (including a recent assessment of drought readiness of Okanagan water suppliers). Since agriculture currently utilizes 55% of the water used in the Okanagan[62] it is critical that the sector is engaged in, and aware of, local drought planning initiatives — both to ensure resilience and for effective implementation of these plans during drought conditions.

Within the Okanagan context, additional water storage may provide some supplementary supply.[63] However, the limitations of potential for supply expansion mean that managing demand will be critical for ensuring agricultural water needs can be met in the future. A range of tools and supports are needed to encourage adoption of suitable water management practices (that will enhance sector resilience to future conditions). A number of priority actions — including knowledge transfer, applied research and demonstration and public education — are outlined in the strategies and actions that follow.

The strategies and actions in this section address the following *adaptation goals*:

- *Supporting sector capacity to prepare for, and respond to, drought conditions*
- *Maximizing conservation and efficiency in agricultural water management*

Support the agriculture sector's participation in drought planning

AS INCREASINGLY WARM and dry summer conditions create greater potential for drought in the Okanagan, developing water management plans has become a high priority.[64] Although most of the communities in the Okanagan (with the exception of the Similkameen Valley) share a common watershed, water management in the Basin is highly fragmented and does not reflect this hydrological interdependency.

The Okanagan's water supply is managed by over 50 water purveyors that vary considerably in size.[65] Even within individual municipalities, there can be multiple water providers; for example, the City of Kelowna has five large water purveyors.[66] Water purveyors are encouraged to develop Drought Management Plans that reflect local water supply dynamics and community water needs, and define both the trigger conditions for drought stages and corresponding regulatory responses that might be imposed at each stage.[67] These plans can be augmented with Water Use Plans, which are formal agreements for how water will be shared between licensees, while still providing adequate flows for fish and wildlife.[68]

Some purveyors, such as the Greater Vernon Water Utility[69] and the District of Summerland,[70] have developed comprehensive Water Use Plans with meaningful input from the agricultural sector. Other purveyors have completed little to no drought/water use planning. Furthermore, there is limited consistency across the plans with respect to content and outcomes.[71] The Okanagan Basin Water Board is in the early stages of working with local water authorities to improve local drought planning and response.[72]

For agriculture — the Okanagan's largest water user[73] — the primary concern is ensuring sufficient water supply for sector activities, but it is also critical that agricultural users provide input into drought plans and have knowledge of their content and implications. Ensuring that producers — including the range of water users — are engaged is important to equitable outcomes. For example, some agricultural producers hold independent water licences and may be particularly vulnerable to having their licences suspended during drought.[74]

Following the drought in 2015, the BC Fruit Growers' Association endorsed eight policies to protect orchards during drought and pledged to promote these policies to municipalities and purveyors in the district.[75] There would be value in supplementing this effort with a broader (pan-agricultural) initiative to ensure that agricultural concerns are consistently and effectively incorporated in planning.

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ACTION 1.1A Consult with the agricultural sector to determine cross-sector objectives for drought planning	ACTION 1.1B Develop a framework for (consistent and structured) engagement of agricultural water users in local drought planning processes
• Determine the most appropriate method of consultation with the agricultural sector to achieve planning objectives • Engage in consultation with the agricultural sector in order to: - Share information about the current and projected future state of water supply (to inform priority development) - Facilitate dialogue to develop shared priorities on key water issues (e.g., managing scarcity, water metering and pricing) - Include a diverse group of producer participants (cross-section of production types, water/purveyor sources) - Support incorporation of adaptation – to increase resilience and minimize impacts – in drought planning (i.e., not just drought response) • Develop a shared vision for the agriculture sector's participation in drought planning (to inform Action 1.1B), identifying critical needs and priorities across different production types/water sources	• Identify sector representatives for drought planning processes and determine ways to maintain consistent sector participation • Partner with key organizations (e.g., Okanagan Basin Water Board, water purveyors and irrigation districts) involved in drought planning to pilot, evaluate and implement the framework for agricultural engagement • Convene a forum with the agricultural sector to share results of this pilot

Develop and implement agriculture-specific drought outreach

IN BRITISH COLUMBIA, drought management and outreach is highly complex, due in part to the micro-climatic and geographic diversity at the basin level, and also to the large number of stakeholders and coordinating bodies involved in drought evaluation and communication.[76]

As noted previously, the extremely hot and dry conditions during the summer of 2015 led the provincial government to declare a Level 4 (hydrological) drought for the Okanagan.[77] Although this triggered a high-level set of responsibilities for local purveyors and governments, purveyor responses across the region were varied, with most implementing only basic watering restrictions.[78]

This mixed response partly reflects local circumstances, as the Province's drought levels do not always correspond to the status of reservoirs at the purveyor level.[79] This distinction can lead to confusing messaging to local water users surrounding the health of the water supply and related water restrictions. There is a risk that, over time, these inconsistencies could lead to water users becoming desensitized to drought messaging, creating greater risks around long-term water management and the state of water supply.

Most water purveyors (in collaboration with regional districts and local governments) communicate with their water users via direct mail, as well as through print and digital media.[80] Independent agricultural licensees — those who are not connected to a purveyor — receive direct communication from the provincial government.[81] During the summer and early fall of 2015, the Okanagan Basin Water Board also played an active role in communicating weekly drought updates, as well as hosting drought workshops and webinars.[82]

Despite the range of existing communication methods, there is need to implement a communication strategy that results in consistent, timely and accurate information about water supply and the expected or required reductions. In particular, producers emphasize the need for reliable information that is based on the state of their *local* water supply, so they can make appropriate water management decisions. If water users trust that information and notifications pertain to their own water sources, this is also likely to enhance implementation of voluntary conservation measures in the future.

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ACTION 1.2A **Create a consistent (and data driven) system for disseminating source-specific water supply information**	ACTION 1.2B **Establish and implement sector-appropriate outreach mechanisms**

• Consult with producer groups, local water authorities, municipal and provincial governments to assess:
  - Effectiveness of existing approaches for drought communications
  - How/if communication differs by water source and purveyor
  - Relationship between Provincial drought levels and local drought levels in relation to different water sources
  - Communication gaps (e.g., are water users that aren't connected to a utility receiving drought information?)
• Partner with local water authorities (along with agricultural groups and relevant government agencies) to develop approach and options for dissemination of source-specific drought information
	• Identify effective/preferred mechanisms for distribution of drought communication materials by sector group (element of consultation in 1.2A)
	• Incorporate information about how climate change will impact water supply
	• Pilot and evaluate communication options in two to three areas with local and source-specific focus identified in Action 1.2A
	• Identify suitable mechanisms and partners for broader and longer-term distribution of drought information to agriculture sector (incorporating findings of pilot)

Provide knowledge & technology transfer for agricultural water management

ALTHOUGH THE OKANAGAN is considered to have one of the most favourable climates for agricultural production in the province, in many cases moisture deficiency during the late spring and summer make irrigation a necessity.[83] Agricultural operations rely on a broad range of irrigation methods to maintain the productivity and quality of their crops.[84]

The Agriculture Water Demand Model for the Okanagan Basin indicates that approximately 20% (3,787 hectares) of the total irrigated land base area is in horticultural crops that are serviced by efficient irrigation systems (i.e., drip, microspray and microsprinkler systems). In total, it is estimated that 52% of irrigated acreage (primarily fruits and vegetables) could be utilizing more efficient systems than are currently used.[85]

Increasing awareness and uptake of existing (BC-specific) tools such as irrigation scheduling calculators,[86] irrigation manuals and guides could assist some producers with taking steps to improve water management practices.[87] Cost-shared irrigation management plans are also available (for qualifying producers) through the Environmental Farm Plan and Beneficial Management Practices Programs.[88] The Beneficial Management Practices Program also includes cost-share opportunities for water saving technologies such as weather stations, soil moisture sensors and moisture meters.[89]

A range of new mechanisms (to complement existing resources) could also encourage adoption of adaptive water management technologies and practices. Development of cost-benefit analyses for various technologies and practices and commodity-specific water management guides would assist producers in determining how to optimize water use for their production systems. Piloting a "water field agent" for Okanagan agriculture — an individual dedicated to working with producers to evaluate and improve their water management — may also be a very effective means for cross-sector water-related knowledge transfer.

ACTION 1.3A Share and promote existing (BC-specific) water and irrigation management tools and resources	ACTION 1.3B Develop (new) knowledge transfer resources to provide information about water management best practices
• Assess opportunities to improve adoption of existing tools and resources • Promote irrigation assessments – and related cost-share opportunities – available through and the Environmental Farm Plan (EFP) and Beneficial Management Practices (BMP) programs • Provide workshops and/or presentations at sector meetings and events to share and demonstrate tools (e.g., irrigation calculator and manuals, soil moisture sensors)	• Develop (full) cost-benefit evaluations of water management technologies/practices to inform producers and encourage adoption • Develop commodity-specific water management guides focusing on optimizing water use • Promote and enhance informational resources about practices for preserving and enhancing soil moisture • Pilot a dedicated field/extension agent for cross-sector agricultural water knowledge transfer

Undertake applied research and demonstration for practices and technologies to improve resilience to hot and dry conditions

OKANAGAN PRODUCERS ARE experienced at managing through hot, dry summers, but increased evapotranspiration and reduced soil moisture retention (due to warmer and drier summer conditions) will create new management challenges.[90] Demonstrating and evaluating innovative technologies and management practices (within the Okanagan context) to build resilience to these conditions will assist producers with on-farm decisions and investments.

Applied research creates opportunities to test practices and trial varieties, while minimizing the risk for individual producers. There is a strong history of agricultural research in the Okanagan, due largely to the presence of government research agencies, active industry organizations and post-secondary institutions. For many decades, Agriculture and Agri-Food Canada's Summerland Research and Development Centre has been conducting Okanagan-specific research. However, this research is not always accessible to producers and may not include an economic analysis component.

Okanagan-based industry organizations are also active in research and dissemination. For example, the BC Wine Grape Council collects a levy from growers to undertake research and education on viticulture and enology.[91] Similarly, the BC Cherry Growers undertake (5–6) priority research projects annually through grower cost-shared funding.[92] Many other industry organizations support research and/or share findings with their members through their websites, newsletters and meetings. The new Farm Adaptation Innovator Program is partnering with organizations in the Okanagan to support demonstration, evaluation and knowledge transfer of farm practices to improve resilience and/or reduce weather-related risk.[93]

Local research is critical to the agriculture sector's capacity to adapt — particularly applied research that includes demonstration and knowledge transfer components. The diversity of Okanagan agriculture creates a broad range of research priorities.

Adaptation challenges are increasing the value of research that crosses commodity lines, addresses shared priorities and benefits a wide range of producers. Two priority areas emerged out of the *Adaptation Strategies* workshops, and these are highlighted in actions below.

ACTION 1.4A Demonstrate and evaluate options for increasing crop resilience (to hot and dry conditions)

- Ensure distribution of information regarding research already completed in the region (e.g., AAFC research results)
- Support demonstration/applied research (in areas such as variety and crop selection trials, root stock selection, soil/mulch management and crop protection technologies) and incorporate data collection on (full) cost-benefit and payback period
- Partner with industry groups to disseminate information (field days, interpretive signage at project sites, fact sheets, web-based information)

ACTION 1.4B Demonstrate and evaluate options for innovative agricultural water management technologies and practices

- Ensure distribution of information regarding research already completed in the region (e.g., AAFC research results)
- Support demonstration/applied research (in areas such precision irrigation, deficit irrigation, soil moisture management) and incorporate data collection on (full) cost-benefit and payback period
- Partner with industry groups to disseminate information (field days, interpretive signage at project sites, fact sheets, web-based information)

IMPACT AREA 1 > STRATEGY 1.5

Undertake education and outreach (for Okanagan residents) to increase understanding of agricultural water use and climate change

THE OKANAGAN, KNOWN for its extensive system of lakes and rivers, suffers from a 'myth of abundance' relating to its water supply.[94] Located in the rain shadow of the coastal mountains, the region receives very modest amounts of annual precipitation and over 80% of this is lost to evapotranspiration throughout the year.[95] What is remaining supplies the region's water users.

The Okanagan Basin has very high per capita water use compared to other communities in BC and Canada, due in large part to outdoor residential water use during the summer which comprises 24% of the region's water demand.[96] Residential indoor water use makes up 7% of water demand, golf courses 5% and commercial/industrial 6%.[97] Agriculture is the largest water user in region, comprising 55% of water demand.[98] Agricultural production is also one of the largest economic drivers for the Okanagan region and water is an essential input for the sector.[99]

Agricultural water use — for irrigation, livestock watering and crop protection — is essential to maintain the health and viability of crops and animals. However, the non-farming public doesn't necessarily understand agricultural water use or the potential impacts of climate change on local water sources that are critical for agricultural production. Improving this understanding is important, both to maintain the social license for the sector, and so that communities opt to prioritize agricultural water in times of scarcity.

Climate change and local population growth (and corresponding increases in water demand) will put pressure on the Okanagan's water supply. All water users will be required to maximize their water use conservation and efficiency. Existing local initiatives to promote water conservation and education about local water resources are not focused on education about agricultural water use.[100] A targeted strategy could enable communication about the importance of water to agriculture and the shared responsibility for management of water demand in the Basin.

ACTION 1.5A Develop information materials to improve public knowledge of agricultural water use/practices and climate change

- Bring potential partner organizations (e.g., producer organizations, OBWB/Okanagan WaterWise, local governments) together to develop a collaborative outreach strategy that includes:
  - The importance of water for agriculture and how this water is used
  - Agricultural actions/innovations for water conservation and efficiency
  - Linkages to domestic water use and domestic water conservation
  - Impacts of climate change to the local water supply
- Determine the most suitable mechanisms for reaching Okanagan residents (e.g., videos, websites, mail-outs, public events and workshops)
- Implement outreach over a period of time, including evaluation mechanisms and a plan for ongoing communications

Impact Area 2: *Changes to pest populations (insects, diseases, weeds & invasive species)*

As average annual temperatures increase, the range and prevalence of insect pests, diseases and invasive species are anticipated to shift. Climate change may result in an increase in the number and distribution of existing problem species, while enabling new species to become established in the Okanagan region. Extreme weather events also have the potential to introduce new pests from distant areas.[101] In combination, these changes will result in an increase in management complexity and the cost of agricultural production.

Relevant Climate Change Effects

- → Increasing overall average temperatures
- → Increasing frequency and intensity of extreme rainfall events
- → Shifting precipitation patterns (increasing rain in winter, spring and autumn, rain on snow)

Spotted wing drosophila (SWD) — which can affect berries, cherries and soft fruits — is an example of a new insect pest that was first detected in the Okanagan in 2009.[102] Due to mild winter and warm spring conditions, SWD was particularly problematic during the summer of 2015.[103] Other emerging insect pests in the Okanagan include Pacific flathead borer, grasshoppers, apple clearwing moth, apple maggot and balsam woolly adelgid.[104] Climate change is also anticipated to bring about shifts in the distribution, virulence and frequency of disease outbreaks — both in crops and livestock — and to impact the distribution and winter survival of weeds and invasive plants.

The Okanagan's regional districts and producer groups already have experience collaborating with monitoring and managing agricultural pests through the Okanagan-Kootenay Sterile Insect Release Program (SIR). SIR is a codling moth control program targeted at commercial and residential properties with pear, apple, crabapple and quince trees.[105] The program has been operational since 1992 and is credited with suppressing codling moth populations, thereby significantly reducing fruit damage,[106] and with reducing organophosphate pesticide applications for codling moths by 93%.[107]

In addition to SIR, other local resources include Agriculture and Agri-Food Canada's Summerland Research and Development Centre (which conducts locally relevant pest research) and sector organizations which provide their members with various types of pest-related information. The BC Ministry of Agriculture issues pest alerts and assists with production guides that include information about commodity specific pest management options. Invasive species are monitored and managed on a sub-regional basis by the three Okanagan Regional Districts, along with non-profit organizations such as the Okanagan and Similkameen Invasive Species Society (OASISS).

While the above resources provide valuable knowledge and institutional capacity, there remain a number of gaps in surveillance, monitoring and management for economically significant pests. To prepare for and respond appropriately to pest threats, Okanagan producers require timely information about existing, new and emerging pests. Resources for pest identification, as well as suitable options for management and control, are also needed. In addition, distinct management approaches are required for BC's organic operations (a large proportion of which are located in the Okanagan) that face a unique set of challenges relating to pest management.[108]

The strategies and actions in this section address the following ***adaptation goals:***

- ***Supporting integrated and cross-sector approaches to pest monitoring and management***
- ***Enhancing informational resources about pests and climate change***

IMPACT AREA 2 > STRATEGY 2.1

Enhance cross-commodity approaches to monitoring and management for critical insect pests

AS NOTED IN the previous section, there is already foundational capacity in the Okanagan region to address future pest-related challenges. However, this capacity could be significantly strengthened through coordinated and collaborative approaches — particularly those aimed at early detection and management of new and emerging pests.

There remains (an understandable) tendency for commodity group to work independently of one another due to their distinct interests and priorities. In addition, particular approaches to pest and disease management may be an element of export requirements, marketing strategies or industry standards. The Wine Grape Council's encouragement of adoption of Integrated Pest Management through their initiative for Sustainable Winegrowing British Columbia (eventually intended to be a certification program) is one example.[109]

In many cases, daily monitoring and management of pests is undertaken by individual producers to protect their crops and/or livestock. These efforts could be bolstered with improved informational resources and management tools, particularly to address high-risk emerging pests such as spotted wing drosophila.

The experience and success of the SIR Program points to the efficacy of broad cooperative initiatives for managing key pests, and a similar approach could be applied to both a broader range of existing pests and to ensuring effective monitoring and early response for new pests. Coordinated cross-regional and cross-sector approaches have the potential to strengthen monitoring and management, and to improve the cost-effectiveness of both activities.

ACTION 2.1A Develop a cross-sector plan for shared monitoring, management and knowledge transfer	ACTION 2.1B Pilot implementation of new cross-sector approaches for monitoring and management
• Confirm priority (common) pest threats for monitoring and management • Identify critical monitoring gaps and/or shared management priorities • Develop a framework or protocol for early detection and rapid response for new pests	• Develop partnerships to deliver cooperative pilot project(s) • Pilot priorities for monitoring and management identified through Action 2.1A, such as: - Knowledge transfer/outreach to improve land owner and producer awareness for *effective* and integrated management of priority pests - Early detection/rapid response approaches - Enhanced support for multi-producer (group) implementation through existing programs (e.g., Environmental Farm Plan, Sterile Insect Release)

Improve linkages between climate change projections and weather and pest monitoring data

AS NOTED ABOVE, producers in the Okanagan are already experiencing an increasingly complex set of challenges with pest management. New approaches are required to support producers with management — including better decision-making tools that incorporate climate change projections, and improved methods for distribution of existing information.

An accessible (online) information source that includes local weather data, along with information about pests and local production systems, would support time-sensitive and seasonal decisions, while creating the potential for stronger linkages between weather and pest information. A resource that combines weather data with information about pest and disease phenology[110] — and suitable management — creates the potential for a highly integrated approach to pest management, increasingly valuable as decisions become more complex and costly.

To maximize its effectiveness, such a tool requires a comprehensive weather monitoring network and the integration (and maintenance) of suitable decision-support tools. Through the Farmwest website (*www.farmwest.com*) data is currently accessible for 32 weather stations across the Okanagan. This website also provides production decision support tools, but is very limited with regards to Okanagan and pest-specific tools.[111] In addition to development of decision-support tools for the Okanagan context, pest management models may need to be recalibrated to incorporate new climate information.

There are strong models for this type of online resource. Of particular relevance to the Okanagan context is the University of Washington's Decision Aid System which provides ten insect, four disease and four horticultural models for the Washington tree fruit industry.[112] The Decision Aid System combines real-time weather data and estimates on the status of pests; alerts and management recommendations are sent directly to subscribers. Another example of a tool that encompasses both soft fruit and wine grapes is "Vine and Tree Fruit INnovations" an online resource for producers in Ontario, offering a range of decision support tools (although less pest-focused than the previous example).[113]

Any tools or informational resources will only be as effective as their adoption by producers allows, so an equally critical activity will be knowledge transfer. Supporting education and training for existing extension agents, as well as sharing information through sector groups, would enable efficient transmission of information about new and emerging pests, as well as new tools and resources.

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ACTION 2.2A **Develop resources to link weather and pest/disease data with decision support tools (e.g., pest phenology predictions, disease pressure tools)**	ACTION 2.2B **Integrate climate change considerations into pest research and analysis**	ACTION 2.2C **Disseminate pest information and resources broadly to producers and specialists**

• Determine the most suitable tools/models for local needs by:
  - Conducting a scan of existing tools for linking pest/disease monitoring data and weather data;
  - Assessing current monitoring in the region and identifying key gaps and priorities; and
  - Identifying cooperator/ partner organizations.
• Address critical weather monitoring gaps in agricultural areas (to provide locally relevant data)
• Develop an online source for producers to access weather and pest information, along with decision support tools for local production systems
	• Enhance and support research to improve understanding of pest phenology and climate change as well as management options
	• Revisit and recalibrate existing pest management models to incorporate climate change (if/as needed)
		• Provide training/education for local extension agents (e.g., BC Tree Fruit, independent consultants etc.) about pests and climate change
		• Promote available tools and resources through sector organization events/meetings and publications

Strengthen partnerships and knowledge transfer for management of invasive species

AS NOTED PREVIOUSLY, regional governments and local non-government organizations are already engaged in activities to monitor and manage invasive species in the Okanagan. Invasive species are defined as non-native plants and animals that have been introduced to an area outside of their natural range and, lacking local enemies to control them, these species are able to rapidly outcompete local (native) plants and animals.[114] While a range of human activities makes management of invasive species an ongoing issue, climate change will further alter the dynamics of invasive and native species.

Invasive plant species such as puncturevine and longspine sandbur already create challenges for producers in the Okanagan — both by interfering with cropping systems and by creating health hazards for livestock.[115] Although not yet established in BC, even water-borne species such as zebra and quagga mussels — have the potential to create management issues and costs for producers by colonizing irrigation systems.[116]

Early detection and suitable management are extremely important to preventing the spread of any new invasive species in the region. An increased level of vigilance and monitoring is required both within agriculture, and more broadly with non-agricultural landowners. Minimizing negative impacts of invasive species on the agriculture sector will be more effective through cooperative and coordinated efforts across organizations and geography within the Okanagan.

This could include creating more opportunities for groups (from across the Okanagan region) to come together and share information, as well as focused efforts to transfer information to producers and other landowners about agriculturally significant species (e.g., identification, control). As many producers aren't sure where to turn for information, a centralized (Valley-wide) online resource for information and exchange about invasive species could assist producers and strengthen coordination of efforts.

ACTION 2.3A Enhance knowledge transfer for monitoring and management of agriculturally significant invasive species	ACTION 2.3B Create a centralized (Valley-wide) online information source for outreach/knowledge transfer regarding invasive species/pests

• Bring sector organizations and other agencies together for annual "roundtable" to share information
• Increase (region and sector-wide) outreach about agriculturally significant species through mechanisms such as:
  - Email notifications or alerts
  - Fact sheets and management guides
  - Workshops
  - Updates/information at agricultural events/ meetings
• Increase knowledge transfer to (non-producer) landowners about managing agriculturally significant species
	• Develop an online mechanism to provide information about invasive species (and potentially all agricultural pests)
	• Create a digital forum for producers/experts to exchange information (e.g., producer can send photo of pest for identification and/or seek management advice)

Impact Area 3: *Increase in extreme precipitation events*

Although annual precipitation is anticipated to increase only slightly in the Okanagan region, the timing and distribution of precipitation is expected to shift. Summer precipitation is projected to decrease while winter precipitation increases, with a higher proportion of winter precipitation falling as rain rather than snow. Rain will be concentrated in more frequent and intense precipitation events, resulting in challenges with managing run-off (both onto and off) the agricultural land base.

Warmer winter temperatures will also cause more rapid snowmelt and earlier peak stream flows, creating excessive run-off that can be exacerbated by upland activities such as logging.[117] This excessive run-off can result in erosion and, in extreme cases, debris flows, washouts and landslides. Anticipated hydrological changes also increase the risk for run-off related flooding which, while a localized impact, highlights the need for preparation and mitigation activities.

Extreme precipitation events can cause damage to riparian areas (e.g., bank erosion, silting) and loss of productive agricultural lands near riparian corridors. Riparian rehabilitation and the creation of riparian buffers — consisting of planted landscapes between cultivated areas and a waterway — can enhance waterway health and serve as flood control infrastructure.[118] Maintaining and/or rehabilitating both upland areas and riparian areas is likely to be an important mechanism for reducing excess runoff and flood-related damage as stream flows become more unpredictable.

Resources and incentives encouraging installation and stewardship of riparian buffers already exist, but are limited in their reach and capacity. The Environmental Farm Plan and Beneficial Management Practices Programs offer planning and cost-share supports for practices related to riparian areas and erosion management.[119] The BC Cattlemen's Association also operates the Farmland-Riparian Interface Stewardship Program (FRISP) to assist cattle producers with all of the steps involved in protection and enhancement of riparian areas.[120]

Relevant Climate Change Impacts

- Increasing overall average temperatures
- Increase in frequency and intensity of extreme precipitation events
- Shifting precipitation patterns (increasing rain in winter, spring and autumn, rain on snow)

In spite of these resources, addressing runoff and riparian related issues remains a substantial challenge. There is frequently the need for multiple land owners (on or above a watercourse) to work together to reduce runoff and flood risk. Individual producers are often unclear about the benefits to their operation and may find the institutional and regulatory context around riparian activities to be daunting.

Managing run-off and ensuring that riparian areas improve flood control functions requires information and investment. Enhancing knowledge-based and financial tools to support producers with taking appropriate action will reduce the impacts of runoff, erosion and localized flooding, and this will serve both agricultural operations and the broader public interests in the Okanagan.

The strategies and actions in this section address the following *adaptation goals:*

- *Strengthening partnerships for the purposes of reducing runoff, minimizing erosion and enhancing riparian areas*
- *Improving knowledge transfer and resources to reduce runoff, minimize erosion and enhance riparian areas*

IMPACT AREA 3 > STRATEGY 3.1

Improve processes and supports for individual producers to implement runoff and erosion management and riparian rehabilitation activities

AS NOTED ABOVE, there are existing resources available to producers wishing to undertake activities to reduce runoff, minimize erosion and/or rehabilitate riparian areas. These programs have created options for producers to seek both technical and financial assistance. However, the existing programs do not address the complexity involved in undertaking activities in riparian areas.

This complexity is largely the result of environmental, habitat and biodiversity values and the requirements of various agencies pertaining to riparian areas. A brochure from the Farmland-Riparian Interface Stewardship Program (FRISP) maps out the steps toward riparian project approval.[121] While this brochure isn't updated to reflect recent changes in regulations, it points to an ongoing issue with a multi-stage and multi-agency process that is likely to be overwhelming for many individual producers.

Producers participating in the *Okanagan Adaptation Strategies* workshops also expressed concern that this type of activity is both labour and cost-intensive, but will not necessarily create sufficient benefits for the individual producer. This is particularly true when considering the ongoing maintenance of riparian areas. At present, there is no mechanism in place to formalize integration of agricultural production objectives or values into riparian rehabilitation and maintenance approaches and standards.

Greater flexibility around design and maintenance would likely increase the interest of agricultural producers in riparian rehabilitation initiatives. Establishing a riparian framework for agriculture — providing guidelines and sector-specific strategies — might be one way to address this issue. A more thorough assessment of these challenges is warranted — including follow-up with key agencies and stakeholders — to determine how best to enable and enhance implementation of runoff reduction and riparian maintenance and restoration activities.

ACTION 3.1A Assess existing and alternative processes (policy, programmatic and financial tools) to support implementation of runoff/erosion management and riparian rehabitation	ACTION 3.1B Facilitate dialogue between producer groups and key agencies to determine preferred options to improve processes/supports

• Assess the current process and programmatic supports (for producers undertaking riparian rehabilitation) including:
  - Identifying existing supports (e.g., human resources, cost-share incentives, key organizations)
  - Documenting the regulatory process/steps
  - Identifying gaps, issues and opportunities
  - Consulting with producer organizations, government agencies and specialists to identify key issues and/or opportunities
	• Coordinate participation of sector groups and agencies in structured, facilitated workshops (to review assessment from 3.1A)
	• Determine steps for strengthening coordination and support for runoff/erosion management and riparian restoration
	• Explore the potential for a riparian framework for agriculture

IMPACT AREA 3 > STRATEGY 3.2

Strengthen cooperative runoff/erosion management and riparian restoration on individual watercourses

A SUBSTANTIAL CHALLENGE in addressing runoff, erosion and riparian issues on an individual farm or ranch, is that they are frequently affected by broader watercourse and/or upland management practices. While individual producers may undertake work on their own properties, they cannot address the broader systemic issues on a watercourse without cooperation from other landowners. These landowners may include other producers, non-farming neighbours and (particularly in upland areas) government or industry (e.g., forestry companies).

Taking collective action on watercourses is difficult, but can be facilitated through a structured process to bring people together with information and expertise to improve their riparian areas (and reduce local risks associated with climate change). A group in Alberta that enables this type of action is Cows and Fish: Alberta Riparian Management Habitat Society.[122] This organization is the result of a multi-agency partnership and one of its areas of focus is supporting a proactive and community-driven approach to riparian health and management. Collaborative approaches are created through a hands-on and grassroots method that engages producers and community members.[123]

A similar cooperative approach could be tested in the Okanagan. This could involve partnering with local groups to identify areas for piloting and then determining and implementing suitable actions to reduce runoff and improve riparian function. However, for this type of process to be successful in BC, it would likely need to be preceded by actions identified in Strategy 3.1. Any group processes would require engagement and support from key agencies and local governments prior to implementation.

The above approach could be supplemented or facilitated by building on existing programs in BC (that are focused on agricultural stakeholders). The Environmental Farm Plan and Beneficial Management Practices Programs already offer an opportunity for groups of producers to work together to accomplish shared goals. Promotion of group implementation of runoff reduction, erosion control or riparian restoration activities could increase uptake through the EFP/BMP. Additional support and resources for FRISP could also increase its capacity to assist groups of producers to take collective action.

ACTION 3.2A Pilot approaches to bring landowners (and key agencies) together to plan and implement runoff/erosion management and riparian restoration activities	ACTION 3.2B Enhance existing tools/programs (e.g., FRISP, EFP) focused on multi-producer (group) implementation of runoff/erosion management and riparian restoration
• Identify models and best practices for joint planning processes that enable effective implementation • Identify suitable local pilot locations (and interested cooperators) to test and evaluate group implementation • Pilot joint planning and implementation in identified areas (that includes a range of land owners/agencies/actors on a water course)	• Update existing program materials to reflect the current regulatory context (and any other relevant changes) • Seek partners with an interest in bolstering funding opportunities and resources for runoff/erosion and riparian management activities • Develop an engagement strategy with agencies/local governments to support group implementation plans • Strengthen outreach and promotion of the incentives and benefits associated with implementation

Support knowledge transfer for effective management of runoff and erosion and riparian areas

IMPROVING THE DISTRIBUTION and transfer of existing informational resources is a relatively low cost option for supporting increased levels of adoption. Actions to reduce runoff and improve riparian areas hasn't necessarily been widely promoted with the sector. There may be some hesitation to promote these activities if the human resources/financial supports for implementation aren't sufficient. Therefore, the value of any knowledge transfer would be greatly multiplied if it follows the actions identified in Strategy 3.1.

Providing workshops and outreach at times when agricultural producers are available is likely to be effective, as well as linking knowledge transfer into existing sector meetings and events and targeting information to specific commodities. One of the most valuable tools for hands-on education is demonstration. Existing programs (e.g., FRISP/EFP) have implemented projects in the Okanagan that resulted in demonstration sites that can be shared with other producers. However, present capacity to document, share and distribute results is limited, so bolstering the ability of these programs to broaden their demonstration and knowledge transfer activities would be helpful.

Existing materials could be supplemented by cost-benefit analyses (based on case studies) that identify, evaluate and promote a range of benefits that have not necessarily been considered or quantified. One such evaluative project, led by the University of British Columbia Okanagan, is already underway with a group of producers the Okanagan.[124]

It would also be valuable to share results, benefits and challenges of agriculture-focused riparian and runoff management initiatives with local governments and other relevant agencies. This would build understanding about the priorities, issues and needs of agricultural partners in riparian rehabilitation.

ACTION 3.3A Promote cross-agency and sector sharing of key resources and demonstration opportunities

- Undertake a scan of existing activities across the region (to support runoff/riparian management activities) including demonstration sites
- Develop cost-benefit analyses of activities to reduce runoff and/or improve riparian area function
- Bring potential partners together to share information about current activities and resources
- Enhance coordination of knowledge transfer resources and demonstration sites

Impact Area 4: *Increasing wildfire risk*

Wildfires, and wildfire related evacuations, are a regular occurrence in the Okanagan region, due largely to the arid climate and extensive development on the wildland-urban interface.[125] However, the past decade has been marked by a number of severe fire years, including in 2009, 2014, and 2015. The 2003 Okanagan Mountain Park fire was the most significant wildfire interface event in BC history, resulting in large-scale evacuations and the loss of over 200 homes.[126] The fire also completely destroyed St. Hubertus winery and many other wineries in the region lost their crops due to smoke taint.[127] In 2015, wildfires led to a number of evacuations and evacuation alerts for agricultural operations in the Oliver area.[128]

With projections for more prolonged warm and dry periods, and an increase in the number of extremely hot days, it is anticipated that the Okanagan will experience larger and more frequent wildfires[129] and an extension of the wildfire season.[130] Forest die-off due to pine beetle — and logging practices that leave fuel behind — are also increasing wildfire risk.[131]

Wildfires jeopardize crop production and quality, livestock health and agricultural infrastructure.[132] Agricultural operations not immediately threatened by fire can be adversely affected by ash and smoke, with smoke taint being of particular concern for wine grape producers. Some longer lasting agricultural impacts of wildfire include changes to soil characteristics and species composition where intensive burns have occurred. Flooding, soil erosion and landslide risk may also increase in burned or adjacent areas.[133]

Wildfire response in the Okanagan is managed by the BC Wildfire Service — in conjunction with local fire authorities. Effective mitigation of interface fire risk requires collaboration between multiple levels of government and individual landowners.[134] Fuel management is a critical element of wildfire mitigation and is the focus of a number of the actions below. A range of resources is available to producers and landowners to help mitigate risk to their properties and livestock. However, there are presently no resources tailored to the BC agriculture sector, or to the specific types of agricultural operations and conditions in the Okanagan.

Relevant Climate Change Impacts

- → Increasing number of summer warm days and extremely hot days
- → Decreasing precipitation in summer
- → Increasing variability of conditions

Developing and promoting locally suitable resources would support increased adoption of preparedness and mitigation actions. Strengthening initiatives for fuel management, as well as sector-level, community-level and individual producer preparedness, will all play a part in reducing the impacts associated with future wildfires.

The strategies and actions in this section address the following *adaptation goal:*

- → *Enhancing tools and resources for wildfire preparedness and mitigation*

Support cooperative approaches to fuel management activities

AS NOTED IN the previous section, preparing for and mitigating wildfire risk to agricultural operations relies on action at various levels, but particularly on private properties and in interface areas. Ranchers are also concerned about impacts to fencing infrastructure and rangeland and pasture areas. Fuel management is a critical element of wildfire mitigation and refers primarily to reducing the "fuel load" (vegetation) — and the accompanying level of risk — within the agricultural/wildland interface.

Fuel management along fence lines or property edges (which often abut onto Crown land) is a complex activity. It is not only expensive and time consuming to reduce fuels through pruning or falling trees, but the regulations regarding maintenance of these areas are also challenging for individual producers to interpret. In addition, there are requirements for proper removal of fuels once they are felled.[135]

Burning fuel piles requires expertise and even permitted open burning includes liability risks for producers. While converting felled fuels into wood chips is a high cost option for individual producers, there may be opportunities to revisit, modify and reinitiate previous chipping programs such as the Agricultural Wood Waste Chipping Program,[136] with a new focus on supporting fuel management.

Building on existing resources and knowledge, a relatively low cost first step to enhance fuel management would be to identify the highest priority geographic areas and/or issues where collaborative solutions are needed. This planning would require producer participation and engagement from local and provincial government agencies. Implementation of fuel management in these prioritized areas would also require cooperation and partnerships. It will be necessary to work closely with the BC Wildfire Service, regional districts, or directly with licensees to resolve barriers to fuel management, determine the most effective and efficient treatments, and reduce liability concerns for the private property owner or agricultural business.

ACTION 4.1A Identify common threats/issues and specific (geographic) areas where collaborative solutions are needed	ACTION 4.1B Support implementation of priority (selected) fuel management activities
• Define priority areas and appropriate cooperative management activities by: - Engaging BC Wildfire service (and other wildfire management professionals) for input - Identifying high/extreme risk level areas on agricultural land base from Community Wildfire Protection Plans (CWPPs)[137] - Coordinating focus group discussions in agricultural areas to confirm priority locations • Determine resources, expertise, partners and approvals required to implement activities	• Implement priority activities (identified through Action 4.1A) that may include: - Training, demonstration and/or piloting of silvo-pasture projects in wildfire risk areas - Convening key partners (BC Wildfire Service, forest licensees, Ministry of Agriculture range staff) to discuss options for removal of forest fuels near agricultural operations - Determining the feasibility of a multi-stakeholder or cross-region chipping program (review lessons learned from earlier studies/programs) - Identifying the extent of producer demand for logging slash as an input (for mulch/compost) and linking producers to logging waste supply

Support individual operations with planning for wildfire preparedness and mitigation

WHILE WILDFIRE RESPONSE is largely the responsibility of government agencies, there is a need for individual producers to prepare, and take steps to mitigate potential impacts, in advance of a wildfire. There is a broad range of operation types in the Okanagan and this diversity means that appropriate strategies are likely to vary considerably. Recent experiences with fires in this region provide a strong base of knowledge for producers to incorporate into preparedness and mitigation planning.

The primary existing approach to mitigation and preparedness on private property is through the FireSmart program. This program enables groups of residents to plan for wildfire safety on their own properties and in their community (which can be a rural area or a group of farms or ranches).[138] All-hazard emergency planning guides have been developed for some BC commodities and the (high-level) wildfire sections of these documents provide additional materials.[139] While the above opportunities are available, it appears that many producers are not aware of them (and therefore uptake is minimal). Collaborating with Partners in Protection Canada, local governments and local fire departments to promote agriculture-focused knowledge transfer is a logical step.

A pilot project is also underway (anticipated completion in June of 2016) in the Cariboo region that has the potential to be adapted for the Okanagan context.[140] This project is developing a template for individual ranch operators to identify priority assets, key risks and possible actions for wildfire preparedness/mitigation. Common costs, issues and barriers around implementation of mitigation measures are also being identified through this project. Additional steps would be required for this tool to be applicable to the range of Okanagan operations.

ACTION 4.2A Pilot wildfire preparedness and mitigation planning tools for individual operations	ACTION 4.2B Undertake knowledge transfer and training to support individual operation preparedness/mitigation
• Develop two pilot approaches (one for ranches, one for other commodity types) for developing individual operation wildfire plans; build on the Cariboo region wildfire pilot project • Assist producers to identify and implement fuel management strategies on their own properties	• Partner with local governments and Partners in Protection Canada to provide knowledge transfer and education around existing resources and technologies (e.g., FireSmart workshops, demonstration sites and print/web-based materials) • Develop effective distribution/communication for planning tools resulting from Action 4.2A • Facilitate *ongoing* agriculture sector access to, and uptake of, FireSmart tools and resources resulting from 4.2A

Support regional-scale planning and implementation for wildfire preparedness and mitigation

IN BRITISH COLUMBIA, local fire departments, regional emergency and protective services and the provincial Wildfire Management Branch are responsible for different aspects of fire prevention and management. Regional districts play a coordination and administrative role, providing consistency across local fire departments, which positions them well to lead wildfire planning and preparedness initiatives.[141]

Community Wildfire Protection Plans (CWPPs) are developed by local governments to define wildfire risk areas, to identify measures to mitigate risks, and to outline a plan of action and associated costs for implementation.[142] However, at the landscape level, the focus of wildfire mitigation and fuel management activities is on areas of high and extreme risk on Crown land.[143] Existing planning processes and implementation programs do not necessarily include the agriculture/wildland interface and areas of high priority for the agriculture sector.

The Regional District of Okanagan Similkameen and the Regional District of Central Okanagan — along with Kelowna and West Kelowna — have completed CWPPs. Revisiting CWPPs to include more agricultural values would also enable local governments to pursue funding for fuel management treatments in agricultural areas. Despite their limited scope, CWPPs often contain recommendations that are of value to the agriculture sector. Fostering partnerships to drive implementation of these actions would be a valuable step.

In addition to extending the scope of CWPPs, livestock relocation and management planning is another priority area for Okanagan producers. This type of planning is of particular concern to the dairy sector but also to other types of livestock operations. For such plans to be effective, they require engagement of the sector during their development and following completion (to ensure producers provide input and are aware of the implementation steps). A completed plan can also provide a mechanism to share information (with key agencies) in advance of an emergency, and to support more effective lines of communication in the event of a wildfire.

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ACTION 4.3A **Support development of Community Wildfire Protection Plans (CWPPs) – in partnership with agricultural stakeholders – and implement recommendations of benefit to agriculture in existing CWPPs**	ACTION 4.3B **Establish regional livestock emergency relocation and management plans**

• Encourage and support development of Regional CWPPs (where they do not exist) and highlight the need for recommendations pertaining to agriculture sector
• Support implementation of actions from completed CWPPs, such as:
  - Developing a database of water supply sources and locations in agricultural areas (stored and natural)
  - Developing landscape level fuel breaks adjacent to the Regional District wildland interface, prioritizing high value agricultural operations (see 4.1A and 4.1B)
• Foster periodic direct dialogue between high-risk range tenure holders and BC Wildfire Service to exchange information (e.g., size of operations, locations of grazing / grazing plans, locations of access roads)
  - Link meeting to local and/or BC Cattlemen's Association Annual General Meeting
  - Ensure that local protection office/ fire departments *and* relevant provincial government agencies receive information
	• Determine geographic scope of planning and confirm which commodity groups wish to be included
	• Develop emergency/relocation management plans that include:
	  - Consideration of the various emergency and relocation needs of different types of producers/ operations
	  - Designations of levels of relocation required for different areas
	• Coordinate a workshop between local governments and BC Wildfire Service to ensure pertinent information about livestock plans is provided in advance of emergency situations

Implementation & Monitoring

While all of the actions contained in this plan are important for the Okanagan sector to adapt to climate change, the actions on the following pages are identified as "next steps." This is due to their importance and may also reflect their relative ease of implementation, or their potential to build capacity for further adaptation actions (see text box on this page). Building momentum and capacity for collective action, and addressing the most important issues, will help to ensure implementation of all of the identified actions.

As the final stage in plan development, an implementation meeting was held with key partners (30 individuals) to prioritize actions and determine how to move forward with them. The input received at this meeting informs the content below.

In some cases, individual actions have been merged into single projects because this is the most effective and efficient way to accomplish them. Implementation conditions, such as potential partners and cost range, are identified for each of the next steps.

In order to move forward with project implementation, members of the Advisory Committee that supported the development of this plan will transition into a local working group to oversee the implementation and monitor progress. This group will continue to include agricultural organizations, local government and provincial government representatives. The Climate Action Initiative will function as the overall coordinator for this group and will also lead project development and assist with monitoring progress and reporting.

For each action in the Next Steps below, potential partners are identified. Potential partners were determined through workshops and subsequent draft development, but no formal commitments have been made regarding roles in various strategies and actions. Development of partnerships will be a preliminary activity in project development.

- *Important* actions are those that address the highest priority impacts or critical gaps for building resilience.
- *Ease of implementation* refers to actions that can be initiated without delay because there is a window of opportunity, there are clear co-benefits with other actors or programs, or there are minimal barriers to address. These actions can also create momentum to help move more difficult or longer-term actions forward.
- *Capacity building* actions support the sector by strengthening the ability of producers and producer organizations to take effective action. This may include filling knowledge gaps or developing resources that strengthen the ability to act collectively or individually.

NEXT STEPS FOR ACTIONS 1.1A & 1.1B

Actions

- Consult with the agricultural sector to determine cross-sector objectives for drought planning
- Develop a framework for (consistent and structured) engagement of agricultural water users in local drought planning processes

Implementation details

- These actions will be most effective if executed in a step-wise manner, as buy-in is needed for project credibility and effective progress
- Consultation with the agricultural sector may involve a forum, small group consultations, a cross-commodity working group or some other mechanism
- There are existing examples of effective drought planning processes in the region and this project may be linked into (or build on) these

Potential partners

- → Agricultural organizations
- → Water utilities and irrigation districts
- → Independent water licensees
- → Okanagan Basin Water Board
- → Ministry of Agriculture
- → Ministry of Forests, Lands and Natural Resource Operations
- → Regional districts and municipal governments
- → Okanagan Nation Alliance

Timeframe

- Phase 1 (consultation with agricultural sector) = Short term (LESS THAN 2 YEARS)
- Phase 2 = Short-term (LESS THAN 2 YEARS)

Cost

- Phase 1 = Low (LESS THAN $50,000) to medium ($50,000-$100,000)
- Phase 2 = Medium ($50,000-$100,000)

NEXT STEPS FOR ACTION 1.2A

Actions

- Create a consistent (and data driven) system for disseminating source-specific water supply information

Implementation details

- Success of this project will depend on collaboration between many partners
- Okanagan Basin Water Board is currently working on filling data gaps regarding water supply and water use
- Focus on supplying the agricultural sector with 'source-specific' information and then consider feasibility of communication targeted to commodity type
- Will need to develop and test new outreach mechanisms

Potential partners

- → Agricultural organizations
- → Water utilities and irrigation districts
- → Ministry of Agriculture
- → Ministry of Forests, Lands and Natural Resource Operations
- → Regional districts and municipal governments
- → Okanagan Basin Water Board

Timeframe

- Medium-term (2-4 YEARS)

Cost

- Medium ($50,000-$100,000)

NEXT STEPS FOR ACTION 1.3B

Actions

- Support a range of knowledge transfer resources to provide information about existing water management best practices

Implementation details

- This action is intended to be broken down into individual projects (e.g., cost-benefit analysis, water extension pilot, knowledge transfer)
- First step is to determine highest priority knowledge transfer approaches
- Explore opportunities to "piggy-back" on current industry field services and/or partner across groups to pilot water extension agent

Potential partners

- → Agricultural organizations
- → Ministry of Agriculture
- → Agriculture and Agri-Food Canada (Summerland)
- → Post-secondary institutions

Timeframe

- First few projects = Short-term (LESS THAN 2 YEARS)
- Multiple projects = Medium-term (2-4 YEARS)

Cost

- First few projects / knowledge transfer = Medium ($50,000-$100,000)
- Multiple projects = High ($100,000+)

NEXT STEPS FOR ACTION 2.2A

Action

- Develop resources to link weather and pest/ disease data with decision support tools (e.g., pest phenology predictions and disease pressure tools)

Implementation details

- First step is to determine potential for transferability of existing tools (e.g., applicability/accessibility of Washington State University tool for Okanagan context)
- Costs will depend on extent of investment required to develop relevant decision support tools (and to close any weather monitoring gaps)
- Project will be required to incorporate sustainability planning (for maintaining and updating resources/ tools)

Potential partners

- → Agricultural organizations
- → Ministry of Agriculture
- → Sterile Insect Release Program
- → Agriculture and Agri-Food Canada
- → Post-secondary institutions
- → Farmwest

Timeframe

- First pilot = Medium-term (2–4 YEARS)

Cost

- High ($100,000+)

NEXT STEPS FOR ACTION 2.3A

Action

- Enhance knowledge transfer for monitoring and management of agriculturally significant invasive species

Implementation details

- For monitoring, proper identification is crucial and will require specialized training/knowledge transfer
- Focus on broadening reach of existing materials (e.g., OASISS has a strong presence/role in the southern portion of the region but not in north)
- Annual "roundtable" or extension committee will strengthen linkages but there will also be a need to distribute information through established sector communication channels

Potential partners

- → Okanagan and Similkameen Invasive Species Society
- → Sector organizations
- → Ministry of Agriculture
- → Agriculture and Agri-Food Canada
- → Regional districts

Timeframe

- Phase 1: Initial roundtable meeting, materials development and outreach = Short-term (LESS THAN 2 YEARS)
- Phase 2: Knowledge transfer to producers and non-producer landowners = Medium-term (2–4 YEARS)

Cost

- Phase 1 = Medium ($50,000–$100,000)
- Phase 2 = Medium ($50,000–$100,000)

NEXT STEPS FOR ACTIONS 3.1A & 3.2B

Action

- Assess existing and alternative processes (policy, programmatic and financial tools) to support implementation of runoff/erosion management and riparian rehabilitation
- Facilitate dialogue between producer groups and key agencies to determine preferred options to improve processes/supports

Implementation details

- Actions will require leadership, partnerships and broad cooperation to succeed (agricultural groups, provincial and regional governments)
- Need strong facilitation/guidance to find constructive solutions
- Models for effective processes exist in other jurisdictions and could inform BC's future approach

Potential partners

- → Agricultural organizations
- → Ministry of Agriculture
- → Ministry of Forests, Lands and Natural Resource Operations
- → Ministry of Environment
- → Fisheries and Oceans Canada
- → Regional districts

Timeframe

- Short-term (LESS THAN 2 YEARS)

Cost

- Assessment and facilitated dialogue = Low (LESS THAN $50,000) to medium ($50,000–$100,000)

NEXT STEPS FOR ACTION 4.1B

Action

- Support implementation of priority (selected) fuel management activities

Implementation details

- Cariboo pilot project (for wildfire preparedness and mitigation) could inform this action
- Union of BC Municipalities funding is available for fuel management prescriptions and fuel management treatments (for areas identified in Community Wildfire Protection Plans)
- Funding may be available through BC's new Forest Enhancement Program

Potential partners

- → Regional districts and municipalities / fire departments
- → BC Wildfire Service
- → Forest licensees
- → Ministry of Forests, Lands and Natural Resource Operations range staff
- → Ministry of Agriculture
- → Agricultural producers

Timeframe

- Medium-term (2–4 YEARS)

Cost

- Range in costs depending on which fuel management option(s) are pursued, for example:
  - Slash as mulch/compost feasibility study = Low (LESS THAN $50,000)
  - Silvo-pasture pilots = Medium ($50,000–$100,000)
  - Chipping program = High ($100,000+)

NEXT STEPS FOR ACTIONS 4.2A & 4.2B

Action

- Pilot wildfire preparedness and mitigation planning tools for individual operations
- Undertake knowledge transfer and training to support individual operation preparedness/ mitigation

Implementation details

- Cariboo pilot project (for wildfire preparedness and mitigation) could inform these actions
- In 2015/2016, FireSmart grants available for local governments for wildfire preparedness knowledge transfer, planning and public engagement activities
- Tools and resources should reside with the agencies who have the most capacity to share and communicate the information

Potential partners

- → Agricultural organizations and producers
- → Partners in Protection Canada (FireSmart Program)
- → Local governments
- → Local fire departments
- → Agricultural Advisory Committees

Timeframe

- Pilot planning tools = Short-term (LESS THAN 2 YEARS)
- Knowledge transfer / access to existing tools = Short term (LESS THAN 2 YEARS)

Cost

- Pilot planning tools = Low (LESS THAN $50,000) to medium ($50,000–$100,000)
- Knowledge transfer / access to existing tools = Low (LESS THAN $50,000)

APPENDIX A: Weather, Climate & Variability

WEATHER IS WHAT happens on a particular day at a particular location. Farmers are continually required to adapt to weather conditions to effectively plan and manage their businesses. In contrast, climate refers to long-term trends, patterns and averages over time. These are more difficult to notice through day-to-day or year-to-year experiences, or short-term records of weather. However, over a period of decades, recorded observations can characterize the climate and identify trends.

Anyone who pays close attention to weather forecasts appreciates that predictions of weather are often limited in their accuracy. This is partly because of the many factors that impact weather. Turning to longer, climate-related timescales, in BC we are familiar with the 3–7 year cycles of El Niño and La Niña ("ENSO"), which dramatically impact the climate of individual seasons and years (see Figure 5). Compared to La Niña years, conditions in BC during El Niño years are typically warmer and drier in winter and spring, and less stormy in southern BC.

Adding to the complexity, the Pacific Decadal Oscillation (PDO) is a known pattern that shifts over longer time periods (20 to 30 years) and this is associated with different temperature and precipitation conditions here in BC. It also has a warm and cool phase, and so it can either enhance or dampen the impacts of El Niño and La Niña conditions in a given year.

Figure 5 shows the difference between climate variability, oscillations, and climate change. The many factors that impact the weather create significant variation in what we experience from year to year. However, we are still able to chart averages over long periods of time.

For additional resources see *BC Agriculture Climate Change Adaptation Risk & Opportunity Assessment Series* (*www.bcagclimateaction.ca/regional/overview/risks-opportunities/*).

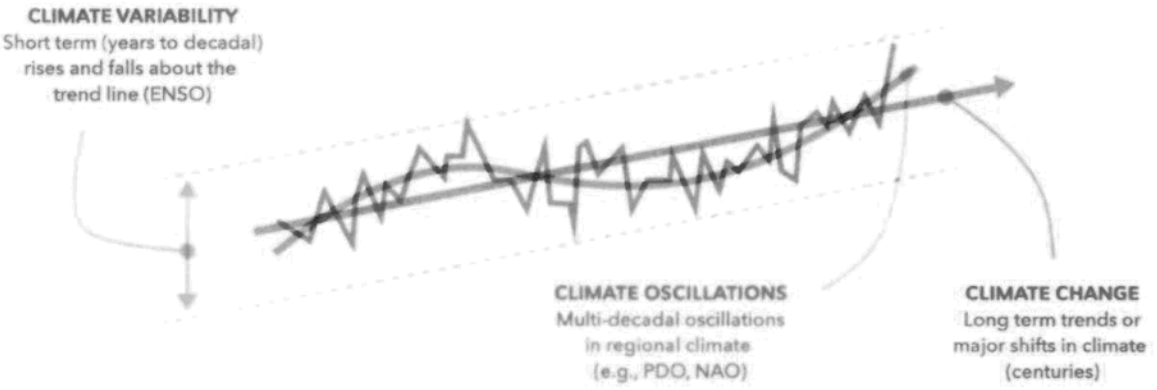

FIGURE 5 Climate Variability, Oscillations & Change

Diagram showing difference between climate variability, oscillations, and climate change. Adapted from original, courtesy of Pacific Climate Impacts Consortium, www.pacificclimate.org

APPENDIX B: Future Projections: Climate Maps & PCIC Tables

TABLE 2 Okanagan Climate Projections — 2020s
(SOURCE: Pacific Climate Impacts Consortium, *www.Plan2Adapt.ca*)

Climate Variable	Time of Year	Projected Change from 1971–2000 Baseline to 2020s		
		Okanagan (Range)	Okanagan (Average)	BC (Average)
Mean Temperature (°C)	Annual	+0.9 °C to +1.9 °C	+1.4 °C	+1.0 °C
Precipitation (%)	Annual	-1.7% to +7.6%	+1.2%	+4%
	Summer	-22.2% to +6.7%	-8.4%	0%
	Winter	-1.7% to +15.9%	+6%	+4%
Snowfall (%)	Annual	-15% to 0%	-9%	-2%
Growing Degree Days (degree days)	Annual	+249 to +386	+249	+153
Heating Degree Days (degree days)	Annual	-642 to -304	-458	-354
Frost-Free Days (days)	Annual	+14 to +31	+21	+10

TABLE 3 Okanagan Climate Projections — 2050s
(SOURCE: Pacific Climate Impacts Consortium, *www.Plan2Adapt.ca*)

Climate Variable	Time of Year	Projected Change from 1971–2000 Baseline to 2050s		
		Okanagan (Range)	Okanagan (Average)	BC (Average)
Mean Temperature (°C)	Annual	+1.3 °C to +3.5 °C	+2.4 °C	+1.8 °C
Precipitation (%)	Annual	-1.3% to +11.9%	+4.4%	+6%
	Summer	-31.2% to +3.2%	-9.2%	-1%
	Winter	-3.1% to +19.1%	+9.2%	+8%
Snowfall (%)	Annual	-27% to -7.2%	-19%	-10%
Growing Degree Days (degree days)	Annual	+221 to +741	+453	+283
Heating Degree Days (degree days)	Annual	-1,104 to -452	-800	-648
Frost-Free Days (days)	Annual	+22 to +59	+38	+20

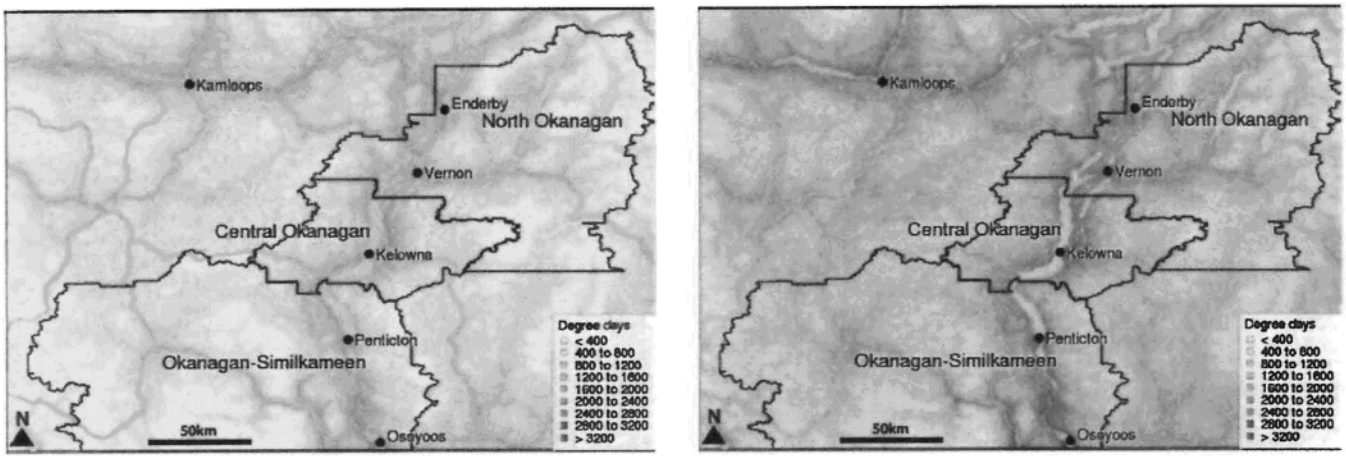

FIGURE 6 Growing Degree Days, Baseline 1971–2000 (left) and 2050s Projection (right)

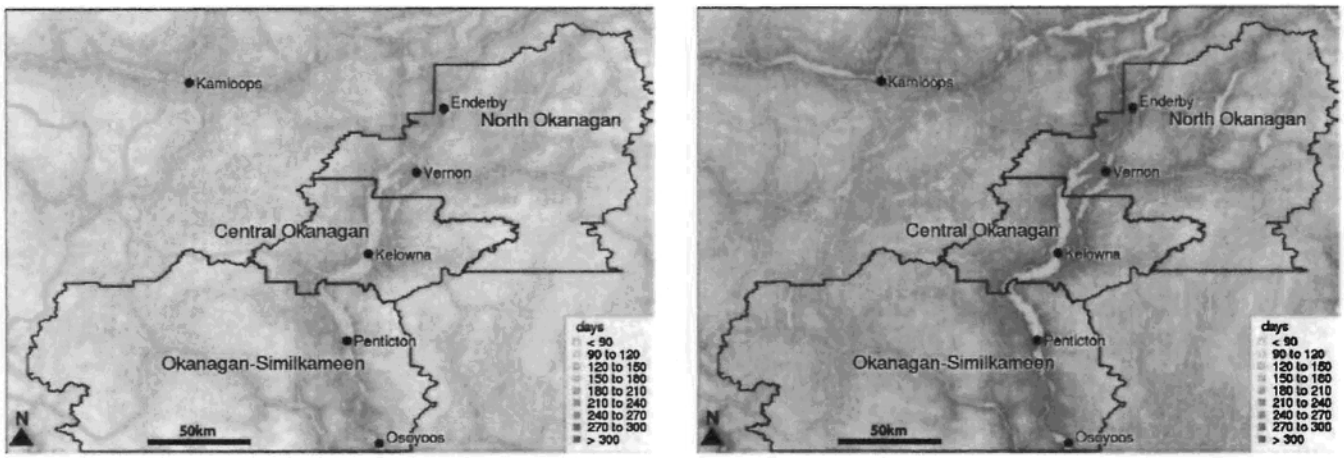

FIGURE 7 Frost-Free Period, Baseline 1971–2000 (left) and 2050s Projection (right)

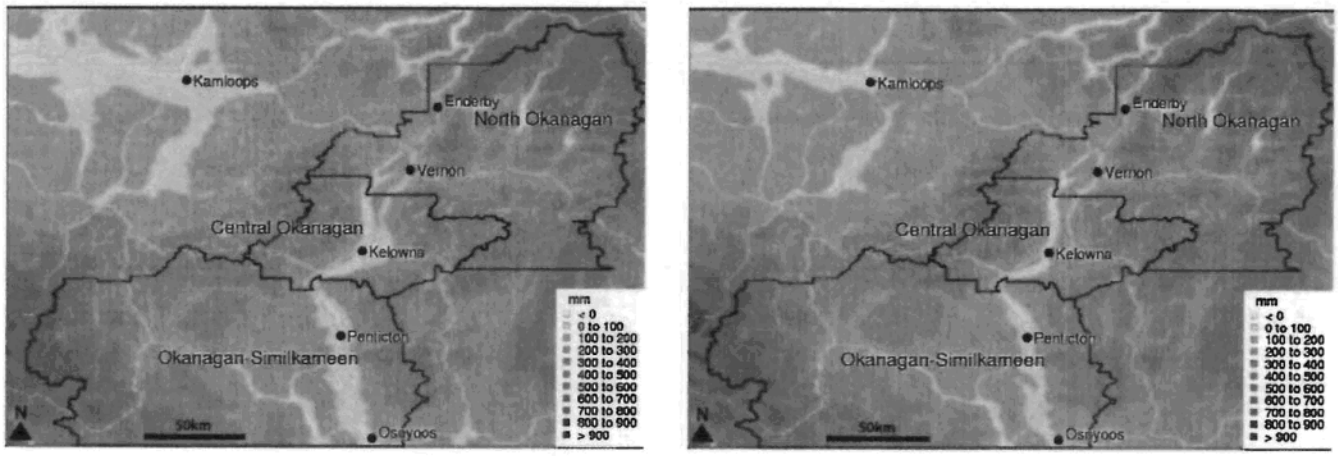

FIGURE 8 Winter Precipitation (mm), Baseline 1971–2000 (top) and 2050s Projection (bottom)

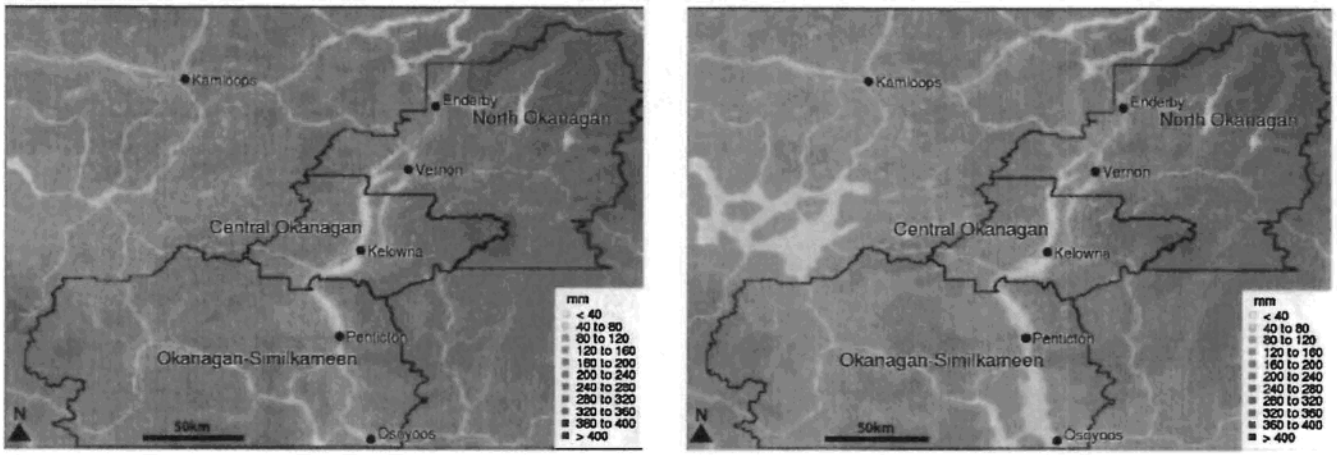

FIGURE 9 Summer Precipitation (mm), Baseline 1971–2000 (top) and 2050s Projection (bottom)

Note that for legibility, winter and summer use different legends and so cannot be directly compared.

APPENDIX C: Definitions

- *Growing Degree Days (GDD)*
  are a measure of heat accumulation, and represent the cumulative number of degrees that the average daily temperature is above a base temperature of 5 degrees, for all days of the year.

- *Frost-Free Days (FFD)*
  are the number of days the temperature is above freezing.

- *Frost-Free Period (FFP)*
  is the consecutive number of days between first frost in fall and last frost in spring.

- *Heating Degree Days*
  are a measure of energy demand, and represent the cumulative number of degrees that the average daily temperature is below a base temperature of 18 degrees (when heating is required), for all days of the year.

- *Cooling Degree Days*
  represent the cumulative number of degrees above a base temperature of 18° Celsius (when cooling is required), and is the opposite of Heating Degree Days.

APPENDIX D: Adaptive Management of Climate Change Impacts

CLIMATE CHANGE ADAPTATION decision-making is an inherently complex task that requires ongoing learning and reflection to adjust to changing information, events and conditions. As learning progresses, new solutions as well as new challenges will be identified. The following questions are provided as tools for navigating this evolving landscape and determining priorities for action.

Additional considerations when determining how to implement priority actions would include:

- Barriers (e.g., legislation, lack of working relationships)
- Assets/Enablers (e.g., leadership, integrating into existing plans/programs)
- Implementation costs
- Operation and maintenance costs
- Financing and resources
- Timeframe

TABLE 4 Developing & Prioritizing Adaptation Actions

Effectiveness	To what degree does this action reduce risk/vulnerability, and/or enhance resilience?
Adaptability	Can this action (and resources dedicated to it) be changed or redirected as conditions change?
Urgency	When does action need to be taken on this issue, in order to be effective by the time an impact is projected to occur?
Gaps & Assets	How does this action address identified gaps or barriers? How can it build on existing assets and resources?
Co-benefits ("no-regrets")	What other benefits would this action have, even if climate change impacts do not occur as projected?
Consequences	What could be the unintended and/or undesirable effects of taking this action? Can these be avoided or mitigated?
Extent	Do the benefits apply broadly in the region, or to specific individuals?
Relevance	Does this action have the support of the agricultural community?

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14 Note: Arable is defined as having productive capacity; not all of this land is necessarily in the ALR, nor necessarily under production. Canada – British Columbia Okanagan Basin Agreement. (1974). Main Report of the Consultative Board: Chapter 1 *http://www.obwb.ca/obwrid/docs/055_1974_Main_Report_Consultative_Board.pdf*

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18 Soil limitations may include: root restriction imposed by the clayey subsoils, late spring frosts, stoniness. BC Wine Institute. (2016) Regions: Okanagan Valley. *http://www.winebc.org/about_bcwi/regions/*

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68 Ibid.

69 The Greater Vernon Water Utility Master Water Plan (MWP) is document that provides direction for the next 40 years to ensure compliance with Provincial standards to safeguard health and to meet future water needs based on predicted growth. *http://www.rdno.ca/index.php/services/engineering/water/greater-vernon-water/master-water-plan*

70 The District of Summerland developed The Trout Creek Water Use Plan — an operating agreement for the Trout Creek reservoirs — through a consultative process in 2004/05 with representatives from the District of Summerland, Ministry of Water, Land and Air Protection, Ministry of Agriculture, Food and Fisheries, Fisheries and Oceans Canada, Agricultural Water Users and the Penticton Indian Band. *http://www.summerland.ca/docs/default-source/works-and-utilities/water/water-availability-report-(march-2014).pdf?sfvrsn=2*

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73 Okanagan Basin Water Board (2011). Local Government User Guide: Okanagan Water Supply and Demand Project. p.11

74 Ministry of Forests, Lands and Natural Resource Operations Bulletin. (August 5th, 2015). Water conservation urged as final Okanagan area increases drought rating.

75 BC Fruit Growers' Association Drought Policy. (2015). *http://www.obwb.ca/newsite/wp-content/uploads/BCFGA_DroughtPolicy.pdf*

76 Ministry of Environment. (2015). British Columbia Drought Response Plan. p.4–6. *http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/drought-info/drought-response-plan-update-june-2015.pdf*

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78 Moore, Wayne. (August 7th, 2015). Confused about drought? Castanet. *http://www.castanet.net/news/BC/145516/Confused-about-drought*

79 Ministry of Forests, Lands and Natural Resource Operations. (August 5th, 2015). Water conservation urged as final Okanagan area increases drought rating. BC Government News: Information Bulletin. *https://news.gov.bc.ca/releases/2015FLNR0224-001253*

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81 Reported communication methods relating to water restrictions for independent licensees based on information gathered at Okanagan Adaptation Workshops in December and February.

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83 City of Kelowna Planning and Development Services. (1998) Agriculture Plan. *http://apps.kelowna.ca/CityPage/Docs/PDFs/Strategic%20Planning/Agriculture%20Plan.pdf*

84 van der Gulik, T., Neilsen, D., Fretwell, R. (2010). Agriculture Water Demand Model – Report for the Okanagan Basin. p.43&49

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86 The Irrigation Scheduling Calculator is available on the website *http://www.irrigationbc.com. The calculator provides users with an irrigation schedule using real-time climate data from Farmwest (http://www.farmwest.com).*

87 The Irrigation Industry Association of BC's (IIAB) website *http:// www.irrigationbc.com* provides irrigation guides and manuals and the IIAB also offers irrigation courses. The Irrigation Scheduling Calculator is also available on the website. Other resources can be found at Waterbucket *http://ww.waterbucket.ca and Farmwest http://www.farmwest.com*

88 The Environmental Farm Plan irrigation assessment guide assists BC farmers with water use optimization water use, thereby improving water management during times of drought, long-term climate change, and competing uses of the water resource. Online at *https://www.bcac.bc.ca/ardcorp/program/environmental-farm-plan-program*

89 Environmental Farm Plan Beneficial Management Practices 2015/2016. p.16. *https://www.bcac.bc.ca/sites/bcac.localhost/files/Ardcorp_Program_Documents/2016-17%20BMP%20List%20APPROVED.pdf*

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91 BC Wine Grape Council. *http://www.bcwgc.org/about-bcwgc*

92 BC Cherry Association. About the BC Cherry Association. *https://bccherry.com/association/about-okcga/*

93 Farm Adaptation Innovator project descriptions and deliverables are available on the website of the BC Agriculture & Food Climate Action Initiative. *Farm Adaptation Innovator Program: http://www.bcagclimateaction.ca/farm-level/adaptation-innovator-program/*

94 Okanagan Water Stewardship Council. (2008). Okanagan Basin Sustainable Water Strategy 1.0. Okanagan Basin Water Board. p.5,6

95 Ibid.

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97 Ibid.

98 The remaining 1% and 2% of water use in the basin are institutional and parks and open spaces, respectively.

99 Okanagan Valley Economic Development Society. (2015) Okanagan Valley Economic Profile 2015. p.25.

100 The Okanagan Basin Water Board operates the Okanagan Water Wise program (which includes the One Valley One Water campaign) and aims to increase awareness among residents about water use and that the interconnectedness of the region's water supply. *http://www.okwaterwise.ca*

101 Plant Health Unit, Plant and Animal Health Branch, Ministry of Agriculture. British Columbia Plant Health Strategy for Agriculture. 2013–2018. p.1.

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103 Quote from Susanna Acheampong, Entomologist with BC Ministry of Agriculture. Global News (July 2015) SWD numbers increase in Okanagan. *http://www.agannex.com/production/swd-numbers-increase-in-okanagan*

104 Acheampong, S. (February 11, 2016). Insect Pest Issues in the Southern Interior of British Columbia. PowerPoint slides from Okanagan Adaptation Workshop.

105 Okanagan Kootenay Sterile Insect Release Program Website. *http://www.oksir.org/*

106 SIR's initial program goal was complete eradication of codling moth in the program's service area, but this was eventually deemed unfeasible and suppression of moth populations below a threshold became the new objective. Today's threshold is less than 0.2% codling moth damage on at least 90% of all commercial pome acreage in the service area.

107 Sterile Insect Release Program. (2011). Sterile Insect Release Program: Guide to the SIR Program. p.20. *http://www.oksir.org/docs/SIRGuide042011FINAL.pdf*

108 Macey, A. (2013). Organic Agriculture in British Columbia – Organic Statistics 2012. p.9 *https://www.cog.ca/uploads/BC Organic Production Statistics 2012.pdf*

109 BC Wine Grape Council. (2016). Sustainable Practices for BC Vineyards: Condensed Guidebook, February 2016. *http://www.bcwgc.org/sustainable-winegrowing-british-columbia*

110 Phenology refers to key seasonal changes in plants and animals from year to year — such as flowering, emergence of insects and migration of birds — especially their timing and relationship with weather and climate.

111 Tools available on the site include Growing Degree Days, evapotranspiration, ammonia loss from manure, corn heat units: *http://www.farmwest.com/climate/weather*

112 Washington State University Decision Aid System: *http://treefruit.wsu.edu/tools-resources/wsu-decision-aid-system-das/* and *https://www.decisionaid.systems*

113 Weather INnovations Consulting LP. Vine and Tree Fruit INnovations. *http://www.vineandtreefruitinnovations.com/index.cfm?devUse=full*

114 Invasive Species Council of British Columbia. "Invasive Species." *http://bcinvasives.ca/invasive-species*

115 Scott, Lisa. (February 10, 2016). Presentation provided at Workshop #2: Climate Change Strategies and Actions. Okanagan and Similkameen Invasive Species Society.

116 Okanagan and Similkameen Invasive Species Society. Aquatic Invasive Species. *http://www.oasiss.ca/aquaticinvasives.html*

117 Scherer, R., Pike, R. (2003). Management Activities on Streamflow in the Okanagan Basin: Outcomes of a Literature Review and a Workshop. FORREX – Forest Research and Extension Partnership.

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119 Producers that have a completed and current EFP are eligible to apply for cost-shared incentives through the Growing Forward 2 Agreement "On-Farm Action" Beneficial Management Practices (BMP) Program to implement actions identified in their on-farm environmental action plans. BMP categories and practices eligible for cost-share funding can be found at *https://www.bcac.bc.ca/ardcorp/program/environmental-farm-plan-program*

120 British Columbia Cattlemen's Association. Farmland-Riparian Interface Stewardship Program. *http://www.cattlemen.bc.ca/frisp.htm*

121 Campbell, Clay and Lee Hesketh. (2009). Can I Restore an Unhealthy Riparian Corridor? Farmland-Riparian Interface Stewardship Program, BC Cattlemen's Association. *http://www.cattlemen.bc.ca/docs/frisp_brochure_july_20_2009.pdf*

122 *http://cowsandfish.org/index.html*

123 Cows and Fish. Getting Past the Talk: Working with Communities. Cows and Fish Fact Sheet. *http://cowsandfish.org/pdfs/getting_past_the_talk.pdf*

124 Through the Farm Adaptation Innovator Program, the University of British Columbia Okanagan is working with a group of producers near Armstrong BC, to quantify the social, economic and bio-physical results of a group process to rehabilitate a riparian corridor. Project results will be posted to the BC Agriculture & Food Climate Action Initiative website: *www.bcagclimateaction.ca*

125 The wildland-urban interface is characterized as any area where structures and other human development meet with wildland areas containing flammable vegetation such as trees and grasses. Much of the rural development in the Okanagan exists within the interface; interface fuel management has become a significant priority for local governments in the Okanagan since the fires of 2003.

126 BC Wildfire Service website. *http://bcwildfire.ca/history/largefires.htm*

127 Alley, Lynn. (October 11, 2003). After the Fire, for Okanagan Wineries, It's Business Almost as Usual. The Wine Spectator. *http://www.winespectator.com/webfeature/show/id/After-the-Fire-for-Okanagan-Wineries-Its-Business-Almost-as-Usual_21775*

128 St. Denis, Jen. (August 25, 2015). Wildfire close call sparks wildfire rethink in BC's Okanagan. Business Vancouver. *https://www.biv.com/article/2015/8/bc-wildfires-spark-wine-region-rethink/*

129 Nitschke, C., Innes, J. (2013). Potential effect of climate change on observed fire regimes in the Cordilleran forests of South-Central Interior, British Columbia. Climatic Change, 116, 579–591.

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131 BC Wildfire Service. (2010). Wildland Fire Management Strategy. p.7. *http://bcwildfire.ca/Prevention/PrescribedFire/docs/BCWFMS.pdf*

132 The University of Idaho Rangeland Center and the Idaho Rangeland Resource Commission. (2011). Rangelands: An Introduction to Wide Open Spaces. *http://www.envirothon.org/files/Rangeland_Ecology.pdf*

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134 Sandlink, D. (2009). The Resilience of the City of Kelowna: Exploring mitigation before, during and after the Okanagan Mountain Park Fire. Institute for Catastrophic Loss.

135 *Forest and Range Practices Act*, S.B.C. 2002 c. 69. Range Planning and Practices Regulation, B.C. Reg. 19/2004. *Forest Act*, R.S.B.C. 1996 c. 157

136 Regional Air Quality Program, City of Kelowna Regional Services. Agricultural Wood Waste Chipping Program Information Package. *http://www.rdosmaps.bc.ca/min_bylaws/ES/AQ/2013/General_Information_ProgramSteps-web.2013_4pgpdf.pdf* and Regional District of Okanagan Similkameen. Agricultural Wood Waste Chipping Program: Program Guidelines and Registration. *https://www.regionaldistrict.com/media/117420/AQ_WoodChippingBrochure.pdf*

137 CWPPs serve to identify high-risk areas, provide recommendations to local governments for mitigation and preparedness and prioritize areas for fuel management projects.

138 Union of BC Municipalities. (October 14, 2015). Wildfire Prevention Funding & Resources. *http://www.ubcm.ca/EN/meta/news/news-archive/2015-archive/wildfire-prevention-funding-and-resources.html*

139 The BC Ministry of Agriculture has partnered with industry associations to develop all-hazard planning guides for beef producers, dairy producers and pork producers. Government of British Columbia. (2016). Emergency Preparedness. *http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/farm-management/emergency-preparedness*

140 BC Agriculture and Food Climate Action Initiative. (2016). Cariboo. *http://www.bcagclimateaction.ca/regional/cariboo/*

141 District of Central Okanagan. (2016). Fire-Protection: What we do. *http://www.regionaldistrict.com/your-services/fire-protection.aspx* and Regional District of North Okanagan. (2016). Fire Protection. *http://www.rdno.ca/index.php/services/community-services/fire-protection* and Regional District of Okanagan-Similkameen. (2014). Fire Services. *http://www.rdos.bc.ca/departments/community-services/emergencyprotective-services/fire-services/*

142 What is a Community Wildfire Protection Plan? *http://fness.bc.ca/uploads/pdfs/forest/What_is_a_CWPP.pdf* Upon completion of a CWPP, local governments can apply to the Union of BC Municipalities Strategic Wildfire Prevention Initiative for funding for fuel management prescriptions and for operational fuel treatments *http://www.ubcm.ca/EN/main/funding/lgps/strategic-wildfire-prevention/2016-swpi-program.html*

143 In accordance with the British Columbia Emergency Response Management System (BCERMS) goals, the priorities of the Wildfire Management Branch in descending order are: human life and safety, property, high environmental and cultural values, and lastly, resource values. Much of agricultural land and operations fall under the latter resource values category.

144 NOAA/National Weather Service. (2016). El Nino/Southern Oscillation (ENSO) Diagnostic Discussion. *http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html*

Urls in these Endnotes were current as of March 2016.

Ministry of Agriculture
BRIEFING NOTE FOR MINISTER FOR INFORMATION FOR MEETING
with Emilie de Rosenroll, Executive Director of the South Island Prosperity Project

Ref: 184652 Date: July 21, 2016

Issue: South Island Prosperity Project will be seeking Minister's support for their regionally focused economic development initiative.

Background:
South Island Prosperity Project (SIPP) is a regionally focused economic development body, comprised of representatives from South Island municipalities; private businesses, academic institutions and the Songhees First Nation (see Appendix A for membership details). The membership is governed by a private sector board. Formed in February 2016, the mandate of SIPP is to enhance the economic prosperity of the South Island region by increasing jobs in targeted sectors, and growing the median household income.

The core funding for SIPP is provided by its members. In addition to this core funding, SIPP is seeking the support of federal and provincial governments, and intends to apply for funds through Western Economic Diversification and Provincial programs. The letter sent to Minister Letnick, received June 28, 2016, refers to intention to access funding from Investment Agriculture Foundation (IAF).

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First Nations Considerations:
Songhees First Nation is a member of SIPP.

Discussion:
SIPP has a narrow, targeted focus on increasing the number of jobs in the region in specific sectors. These target sectors are deemed to be those that have regional relevance to the South Island, as well as global export possibilities.

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By focusing on these priority sectors, SIPP intends to operate in an action oriented, focused manner that differs from other, broad based economic development organizations. SIPP has indicated that technology and tourism are not target sectors.

SIPP's target sectors overlap with key sectors of the BC Jobs Plan. SIPP may wish to discuss their initiatives with Ministry of Jobs and Tourism (JTST) representatives directly to discuss how their operating plan will align with the goals of the BC Jobs Plan. With respect to accessing funding through IAF, there is the potential that SIPP member organizations (i.e. academic institutions, industry associations) could apply to the Canada-BC Agri-Innovation Program for support towards an innovative agriculture based project. However, the focus of this funding is to support innovation in agriculture; applications are not assessed on the basis of job creation. The Ministry of Agriculture does not have a program with IAF that provides broad based financial support for regional economic development initiatives.

Next Steps/key messages:
- Appreciate the opportunity to hear about the work of SIPP, encourage you to engage with JTST to discuss alignment of your goals on a regional level.
- The Ministry of Agriculture is focused on enhancing the productivity and competitiveness of the agricultural sector; I welcome opportunities to discuss initiatives you have that align with these goals.

Contact: Selena Basi, A/Manager Innovation, Innovation and Adaptation Services (250) 356-6660

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APPENDIX A: Founding Members of SIPP (as of April 25, 2016)

Municipalities:
District of Central Saanich
City of Colwood
Township of Esquimalt
District of Highlands
District of North Saanich
District of Oak Bay
District of Saanich
Town of Sidney
City of Victoria
Town of View Royal

Industry/Business Associations
VIATEC
Greater Victoria Chamber of Commerce
Victoria Real Estate Board
Tourism Victoria
Greater Victoria Harbour Authority

Private Members
CUBE Global Storage
Coast Capital Savings Credit Union
Butler Brothers Supplies
Wilson's Transportation
Ralmax Group
Coastal Community Savings Credit Union
Knappet Projects

Non-Profit Organizations
Royal McPherson Theatres Society
Victoria foundation

First Nations
Songhees Nation

Post Secondary Institutions
University of Victoria
Camosun College
Royal Roads University

Ministry of Agriculture

BRIEFING NOTE FOR MINISTER FOR INFORMATION FOR MEETING WITH BEN STEWART, BRITISH COLUMBIA'S SPECIAL REPRESENTATIVE IN ASIA, WEDNESDAY, JULY 28, 2016

Ref: 184815 Date: July 25, 2016

Issue: Ben Stewart, BC's Special Representative in Asia, is meeting with Minister Letnick for updates on several issues, including marketing/e-commerce, aquaculture capacity and licensing, and progress on Growing Forward 3 negotiations.

Discussion:

1) Update on Marketing Materials and E-Commerce

Marketing Materials:

- The BC Agrifood and Seafood Export Ready Business Catalogue, an action item in BC Agrifood and Seafood Strategic Growth Plan, was created to support the development of international markets for BC agrifood and seafood products.
- The catalogue is intended to be handed to buyers at trade meetings in BC's key export markets to showcase the range of products available from BC and facilitate the development of trade relationships.
- The catalogue was printed in English on July 22, 2016. Once the catalogue is formally announced (currently scheduled for August 9, 2016), English copies will be sent to MLA's, Trade and Investment Representatives (TIR), Canadian Trade Commissioners and organizations and companies featured in the catalogue.
- Each BC Trade and Investment office will receive 50 printed English copies for use and distribution while Chinese/Korean/Japanese versions are being prepared.
- An online PDF version of the English catalogue will be posted on britishcolumbia.ca after it is announced in August.
- MIT is currently in the process of translating the catalogue into Chinese, Korean and Japanese – printed versions of these catalogues will be sent to each TIR office in China, Korea and Japan once available.
- For other information regarding the catalogue, please see the attached Question and Answers document (Attachment 1).

E-Commerce:

- In 2015, AGRI commissioned a report to describe the different e-commerce business models and strategies available, and the key e-commerce opportunities and challenges facing BC agrifood exporters in China and the United States.
- In 2016, AGRI presented the information gained from this report to BC's agrifood and seafood industry through two e-commerce focused seminars in the lower mainland – "An Introduction to E-Commerce" and "International E-Commerce with a Focus on China."
- From the report, AGRI is now compiling a set of information pamphlets for industry that will answer common questions regarding e-commerce. The topics include: "Understanding the Basics of E-commerce"; "Choosing a Business Model"; "Choosing a Market Balance"; and, "Expanding Sales – a Step by Step Guide."
- AGRI staff are on a federal/provincial e-commerce working group, led by Agriculture and Agri-food Canada, which is focused on creating and executing a strategic Canada-wide approach to developing the Chinese market through e-commerce. BC had been working on supporting a seafood promotion with YHD.com (one of China's largest e-commerce platforms for fresh and frozen foods) earlier in 2016, but YHD.com wanted a Canada-wide promotion (more product/more companies). AGRI is actively engaged

in the AAFC-led e-commerce working group on China to ensure that BC products are featured prominently in this Canada-wide promotion (date to be determined).

2) Farmed Fish Capacity Under Current Licensing

- Farmed fish culture capacity is a function of the oceanographic conditions of each individual site and the regulatory framework to protect the environment. Therefore, the total industry capacity is best estimated by reviewing the annual harvest over operating sites.
- In May, 2015 there were 74 marine based salmon farm sites growing fish.
- In the same period there were a total 113 tenured marine based salmon farm sites in British Columbia, (39 sites were inactive).
- Harvest from BC salmon farms in 2015 totaled 83,800 metric tonnes, substantially increased from 2014 in which the harvest was 61,500.
- Farmed salmon was BC's top seafood commodity in 2015, at $574.8M in wholesale value which was 40.1 per cent of the value of all seafood and 76.9 per cent of all salmon. Farmed salmon remains BC's number one agri-food export commodity at $411.3M.
- In July 2015, the BC government issued four new tenures for salmon aquaculture operations, two near Hope Island off the northern tip of Vancouver Island, and one in the Clio Channel, east of Port McNeil, and one near Flores Island, north of Tofino.
- At the same time the BC government announced an examination of the application and approval framework to ensure aquaculture operations are socially and ecologically sustainable and can coexist with our wild fishery resource. Specifically, the government has:
    1. Formed a standing Minister of Agriculture's Advisory Council on Finfish Aquaculture that will include members from the Ministry of Forests, Lands and Natural Resource Operations, the aquaculture industry, non-governmental organizations and First Nations.
    2. Examine establishing a protocol for receiving advice from the Aquaculture Stewardship council in regards to tenures for new aquaculture sites.
    3. The feasibility of improved microbe detection at aquaculture sites arising from the work currently being undertaken by Genome BC in tandem with the other scientific evidence/analysis already available to the Province.
- While these actions are being undertaken, the Province will not consider any further approvals for new salmon aquaculture tenures.
- On September 30, 2015 the Ministry of Agriculture provided an industry update that confirmed the following:
    1. The Province, through FrontCounter BC, will continue to receive applications for new salmon aquaculture operations. However, the Province will not be reviewing the applications at this time.
    2. The Province will accept and review for decision any applications looking to amend an existing tenure in support of improvements to safety or operational management and efficiency.
    3. In addition, the Province will also accept and review for decision applications to relocate an existing tenure to a more suitable location if the operations remain consistent.
    4. The BC government will not be reviewing any other type of applications for an amendment to an existing tenure.
- In July 2016 Forest Lands and Natural Resources issued notices of final review, i.e. "tenure offers", on four sites under the relocation provisions of the aquaculture operational land use policy, section 3 of Appendix II and consistent with the September 30, 2015 update to industry. The relocations sites are:
    - Cougar Bay to Marine Harvest Canada and the Kitasoo FN in the Central Coast;
    - Alexander Inlet to Marine Harvest Canada and the Kitasoo FN in the Central Coast;
    - Minstrel Island/Tsa-ya for Greig Seafood B.C. in the Broughton Archipelago; and
    - Robertson Island for Marine Harvest Canada in Queen Charlotte Strait.

3) GF3 Funding Progress and Update

- Federal/provincial/territorial Ministers of Agriculture held their annual meeting in Calgary on July 20-22, 2016. During the meeting, Ministers discussed a range of important issues facing the agriculture sector, including policy priorities for the renewal of the FPT agriculture policy framework ("Growing Forward 3" or GF3.) (See Attachment 2 official communiqué and Attachment 3 Ministerial Policy Statement, attached.)
- The release of the Ministerial Policy Statement marks the formal launch of negotiations toward an FPT Multilateral Agreement, which includes Business Risk Management programs and provides a common framework for the development of provincial Strategic Initiatives through bilateral implementation agreements.
- The current Growing Forward 2 agreement is valued at $400.5M over five years ($47.8M/year from Canada, $32.3M/year from BC) and is set to expire on March 31, 2018.
- The federal government has not yet provided the total value of funding that will be available through GF3, nor how it will be specifically allocated among provinces. The communiqué does confirm that the funding shares will remain at 60/40 federal/provincial.
- The Minister of Agriculture has been authorized to negotiate a new agreement to continue to grow the agricultural, seafood and food processing sectors, including enhanced program eligibility for the seafood sector and food processing, without compromising existing funding level for the primary agriculture sector.
- It is expected that the Multilateral Agreement will be signed in spring 2017.

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E/D JE/LH ADM AL DM DS

Agrifood & Seafood Export Catalogue Questions & Answers

BACKGROUND

1. **Why was this catalogue developed?**
   - Action item in BC Agrifood and Seafood Strategic Growth Plan to support the development of international markets for BC agrifood and seafood products.
   - To be handed to buyers at trade meetings in BC's key export markets to showcase the range of products available from BC and facilitate the development of trade relationships.

2. **Who will use this catalogue?**
   - BC Trade and Investment Representatives (located in BC offices across Europe, Asia and the US)
   - Canadian Trade Commissioner Service (located in embassies/consulates around the world)

3. **Will this catalogue be available on-line?**
   - A searchable, flippable PDF will be available on the BritishColumbia.ca website by the end of summer and then the content of the catalogue will be integrated into the Government of BC website early next year (within the Ministry of Agriculture area of the website).

4. **How much did the catalogue cost to produce?**
   - $100,000 composed of $85,000 (contractor fees for industry outreach, design, writing and development) + $15,000 (printing English version); all GF2 funded

INDUSTRY OUTREACH

5. **How did the Ministry decide which companies to include?**
   - Companies applied for inclusion by responding to an invitation to participate – companies that met the following criteria were included in the Catalogue:
     i. must have a head office in BC or be registered in BC
     ii. must market products that have been either produced, processed* or manufactured in BC
        1. * BC processed food is any food, seafood or beverage product processed and packaged in BC with more than 85 per cent of the product's main ingredients produced in BC. In cases where the main ingredients are not available in BC in sufficient quantities, the food must be processed and packaged entirely in BC.)
     iii. must have an established market within Canada (i.e. successfully selling to retail or food service buyers within Canada on a consistent basis for more than three years)
     iv. must be currently exporting products outside of Canada, or be ready to begin exporting within the next year
     v. must have the capacity to expand sales to meet new orders from international buyers:

1. *financial resources:* capacity to travel to export markets to meet with buyers and support ongoing promotional efforts required to be successful in export markets
2. *human resources:* capacity to manage the development and maintenance of new export trade relationships on top of existing commitments
3. *production levels:* capacity to produce more product to meet additional orders from international buyers, or have sufficient product already produced and available to supply new markets

- Companies were required to submit an application to describe how they met this criteria, and then provide additional details as requested by the Ministry to confirm their eligibility.

6. How were companies informed about this opportunity?

- Over 400 BC agrifood and seafood companies were provided with an opportunity to participate in this catalogue through an email invitation sent out last winter, including approximately 200 well-known exporters that have accessed BC government services and programs over the past few years and a couple hundred more that had identified themselves as export-ready or active exporters in the Ministry's internal database.
    i. An email blast explaining the purpose of the catalogue and the criteria was sent directly to BC agrifood and seafood companies in December 2016.
    ii. A reminder email was sent in January 2016.
    iii. 185 companies that did not respond were called between January 18-29.
- Companies that responded to the invitation with all of the required information by mid-February, and met all of the criteria for inclusion, were profiled in the 2016 Catalogue.

7. Why are some of BC's top exporters missing?

- While some of BC's top exporters chose not take advantage of this opportunity, we have heard from many of them that they are keenly interested in providing their company information for the 2017 Catalogue. Staff have already started a list of companies that want to participate and will be following up with each of them in the months ahead.

2017 CATALOGUE

8. How can new companies apply for inclusion in the 2017 Catalogue?

- Companies are encouraged to email foodsbc@gov.bc.ca indicating their interest in being part of the 2017 catalogue, and staff will follow up with each individual directly.
    i. *Note: foodsbc@gov.bc.ca is an email address used by AGRI's marketing team on international focused marketing materials to avoid using individual staff email addresses. This email is not associated with any specific program or project, but is monitored frequently by AGRI staff.*

9. When will the 2017 Catalogue be ready for distribution?

- The outreach for the second version will begin in late fall and the catalogue is expected to be ready in late spring 2017.

CONTRACTOR

10. Was a contractor hired to prepare this catalogue? If so, how were they chosen?

- Yes, the Ministry conducted a Request for Proposals in August 2015 to identify a contractor to conduct industry outreach and design/write/develop a printable Catalogue. Kimbo Design was the successful proponent of this process (scoring highest among the ten proposals received).

11. Will a contractor be hired for future versions of this catalogue?

- The Ministry is planning to issue a multi-year Request for Proposals later this year to identify a contractor to help with the graphic design, layout and writing of new profiles to be incorporated into future versions of the Catalogue.
- The Ministry will not be hiring a contractor to create and host an online Catalogue, as this will be developed within the current Government of BC website using existing staff resources.

TRANSLATIONS

12. Will this catalogue be translated into different languages?

- Chinese, Korean and Japanese versions will be ready for use by BC Trade and Investment Representatives and Canadian Trade Commissioners by January 2017.

Chinese/Korean

• Procurement and contracting by MIT	1 months
• Translation to Chinese/Korean:	2 months
○ *Translation*	*6 weeks*
○ *Review by TIR Office*	*2 weeks*
○ *Corrections*	*1 week*
• Printing of Chinese/Korean Catalogues in Market	1 week
Estimated time of completion:	**Mid-November, 2016**

Japanese

• Procurement and contracting by MIT	1 months
• Translation to Japanese:	3 months
○ *Translation*	*2 months*
○ *Review by TIR Office*	*2 weeks*
○ *Corrections*	*1 week*
• Printing of Japanese Catalogue in Japan	1 week
Estimated time of completion:	**Mid-December, 2016**

Communiqué
Federal-Provincial-Territorial

For immediate release

Federal, Provincial and Territorial Ministers Set the Direction for the Next Agricultural Framework

July 22, 2016 – Calgary, Alberta

Canada's federal, provincial and territorial (FPT) Ministers of Agriculture today concluded their annual conference with Ministers issuing the Calgary Statement — representing a consensus among Ministers regarding the key priorities to develop the next agricultural policy framework, set to launch in April 2018.

This year's conference was co-chaired by Lawrence MacAulay, Federal Minister of Agriculture and Agri-Food, and Oneil Carlier, Alberta Minister of Agriculture and Forestry. FPT Ministers reaffirmed their commitment to work together to strengthen the agriculture and agri-food sector — an industry that generates over $108 billion for the Canadian economy and employs one in eight Canadians.

FPT Ministers will continue to collaborate with stakeholders to enhance the sector's ability to compete, innovate and capture new opportunities. Ministers discussed increasing market access and development, advancing investments in science, innovation and research, the need for a strong science-based regulatory framework, enhancing public trust, the continued importance of Business Risk Management programs and systems such as supply management, and renewed emphasis on environmental sustainability and climate change. Ministers committed to preserve the integrity of the supply management system.

The Calgary Statement was developed by FPT Ministers based on ongoing discussions with stakeholders and will guide the development of the next agricultural framework. The second phase of federal online consultation was also launched to seek comments on the Calgary Statement and help inform the development of future FPT agricultural programs and services.

Ministers discussed the importance of efficient transportation systems in order for Canada to be a reliable supplier of agriculture and agri-food products to customers around the world, and the importance of access to labour, and finding short- and long-term solutions to labour needs. Ministers also stressed the importance of the quality of Canadian and imported products (reciprocity of standards) and the strict controls to which all foods are subject.

* Although Quebec is not opposed to the content of this joint communique, it will issue its own communique as it considers this joint communique incomplete and not reflective of a full consensus.

Quotes

"The Calgary Statement sets the direction for future agricultural programs and services that will help the sector continue to innovate, grow the economy, create jobs and help grow the middle class. Along with the provinces and territories, I will continue to work with stakeholders and interested Canadians to chart the way forward for Canadian agriculture."

Lawrence MacAulay
Minister of Agriculture and Agri-Food

"Agriculture is an enormous contributor to a strong and diversified Canadian economy. As we move forward, we will continue to work closely with industry and my colleagues from across the country, to implement programs that help ensure the agriculture sector is well-positioned for sustainable growth and continues to be a leader in the global marketplace."

Oneil Carlier
Alberta Minister of Agriculture and Forestry

Quick Facts

- The current agriculture framework, Growing Forward 2 (GF2), is a $3 billion investment for strategic initiatives over five years (2013-2018) by FPT governments in programming to support innovation, competitiveness and market development.
- Canadian farm incomes also continue to hit new records with net cash income expected to close out 2015 at a record $15 billion and remain strong in 2016.
- The GF2 FPT Business Risk Management suite of programs are demand-driven, and to date, have provided over $4 billion in support to help producers address risks that are beyond their capacity to manage and that threaten the viability of their farms.
- In 2015, the total value of Canadian agricultural exports reached an all-time high exceeding $60 billion.
- The agriculture and agri-food sector represents close to seven per cent of Canada's GDP.

Related Products:

- Calgary Statement
- Online consultation
- Growing Forward 2 (GF2)

BACKGROUNDER

On July 20-22, 2016, federal, provincial and territorial (FPT) Ministers of Agriculture from across the country met in Calgary, Alberta for their annual Ministers' Conference. Ministers discussed the opportunities and challenges facing the sector:

Next Agricultural Framework:

- FPT Ministers are currently collaborating on the development of the next agricultural policy framework, set to launch in 2018.
- Ministers issued the Calgary Statement on July 22, 2016 which outlines the overarching themes and priorities that will guide the development of the next framework.
- The Calgary Statement recognizes the diversity of the sector and the importance of flexibility in addressing its changing needs.
- Engagement with stakeholders has been underway since early 2016 and additional consultation activities will be ongoing in the coming months to gather feedback that will help inform future agricultural programs and services.
- Ministers are committed to a strengthened focus on results and continuous improvement of policies and program delivery.

Business Risk Management (BRM):

- FPT Ministers agreed that BRM programming must help Canadian producers address risks that are beyond their capacity to manage and that threaten the viability of their farms.
- FPT Ministers also share the industry's concerns about the level of participation in AgriStability and have tasked officials to consult with industry on options aimed at improving participation in the program, including with young farmers.
- Ministers will continue to consult with industry on BRM as part of the engagement process on the next policy framework and agreed that BRM will play a key role in the next framework.

Market Access, Market Development and Trade Policy:

- Ministers reaffirmed continued support for developing new markets for Canadian products and strengthening Canadian competitiveness in the agriculture and agri-food sectors.
- FPT partners will work collaboratively to ensure effective coordination to support companies in getting their products to market.
- Ministers discussed their support for implementing the Canada-European Union Comprehensive Economic and Trade Agreement (CETA) which will lead to new and expanded opportunities, create jobs and benefit Canadian consumers. Ministers also noted the importance of ongoing consultations on the allocation of the new cheese import tariff rates quotas.
- Ministers look forward to the conclusion of consultations on the Trans-Pacific Partnership (TPP). Ministers also discussed the potential benefits and implications of the TPP, should it come into force.
- Ministers noted the importance of free movement of agriculture and agri-food products within the Canadian market.

Science and Innovation:

- Ministers acknowledged the vital importance of continued investments in science and innovation to drive higher levels of productivity, competitiveness and sustainability in the farming and food processing sector.
- They discussed the importance for these investments to continue the momentum from previous frameworks, the need for funding to align with industry and government priorities, and the importance of flexibility to enable regional approaches and program options that achieve high impact and unlock further potential from all parts of the sector.
- Ministers also discussed the importance of knowledge transfer and uptake by producers to maximize the value of agricultural research investments, and the need for governments, producers and academic institutions to work together to strengthen the transformation of research results into practical advice for farmers.

Environment and Climate Change:

- Ministers discussed the importance of environmental sustainability as a key element in agricultural development.
- Ministers discussed the need for science-based policies that will facilitate clean growth while achieving progress on environmental sustainability and climate change mitigation and adaptation.
- Ministers agreed on the need for renewed efforts on environmental sustainability and to help address the advancement of agri-environmental priorities to support a competitive, innovative and sustainable sector.

Public Trust:

- Ministers acknowledge that Canadian consumer preferences about food are changing. Consumers expect transparency from industry and assurance that food is produced in safe, sustainable and responsible ways.
- Ministers recognize that governments and industry have important roles to play in maintaining trust and confidence in Canadian agriculture and the agri-food system.
- Ministers agree on the importance of continuing to work with industry to build and maintain public trust, and sharing the story of the importance of the sector and the modern, responsible and sustainable practices it uses.
- Ministers reaffirmed their support for continued review and modernization of science-based regulations for food safety, animal health and welfare, and plant health.

Food Processing:

- Ministers reemphasized the strategic importance of the food manufacturing sector in Canada, and recognized the need for FPT governments to work together to assist the sector to improve productivity.
- Ministers also directed FPT officials to examine the capacity of the processing system in Canada to help it introduce new products and processes to improve competitiveness domestically and internationally.

Food Policy:

- Ministers discussed the development of a national food policy that includes promotion of healthy living and safe food, and food security. Minister MacAulay encouraged the continued FPT sharing of ideas about food policy.
- The federal government plans to seek the ideas of Canadians and stakeholders about the scope and directions of a food policy.

Emergency Management:

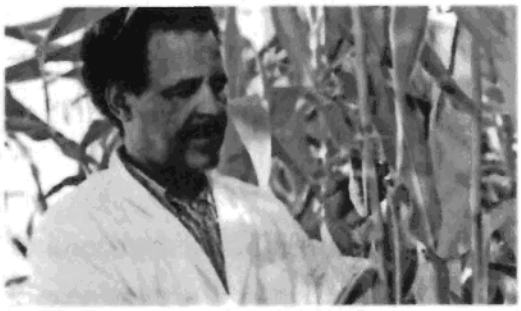
- Ministers endorsed the new Emergency Management Framework for Agriculture in Canada (the Framework). Developed in collaboration with FPT officials, the Framework aims to improve FPT integration and collaboration through a focus on prevention, mitigation and improving the capacity of governments and industry to prepare, respond and recover from emergencies.
- Ministers also endorsed the Livestock Market Interruption Strategy. FPT officials, in partnership with the livestock industry, developed the strategy which includes tools and information to enable all stakeholders to make timely and well informed decisions in case of an emergency, such as foot-and-mouth disease.
- Ministers also endorsed the development of a plant and animal health strategy, including the initiation of stakeholder consultation.

Regulatory Framework:

- Ministers reaffirmed their support for a science- and outcome-based Canadian regulatory framework and acknowledged its contribution to food safety, plant and animal health as well as to trade and market competitiveness. Canada is known for having the highest standards of food safety which helps make our agri-food products more attractive in traditional and emerging markets.
- Ministers agreed to continue to work together across governments and industry to support industry's awareness and understanding of the modernized regulatory requirements e.g. proposed regulations under the Safe Food for Canadians Act.

Towards the Next Agricultural Policy Framework






Calgary Statement | JULY 22, 2016

BRITISH COLUMBIA · Alberta Government · Government of Saskatchewan · Manitoba · Ontario · Québec · Newfoundland Labrador

NOVA SCOTIA · New Brunswick / Nouveau-Brunswick · Prince Edward Island · Yukon Government · Northwest Territories / Territoires du Nord-Ouest · Nunavut · Canada

Introduction

State of the Sector

Canada's agriculture, agri-food and agri-based products sector (hereafter referred to as the "sector") is a cornerstone of the Canadian economy. Today, this highly entrepreneurial sector, and the people whose livelihoods depend on it, impacts every Canadian through an agricultural and agri-food value chain that stretches from the farm gate to the consumer's plate.

The sector generates over $100 billion for the Canadian economy – or close to seven per cent of Canada's GDP – and one in eight jobs. Canada is the world's fifth-largest exporter of agriculture and agri-food products. In 2015, the total value of Canadian agricultural exports reached an all-time high exceeding $60 billion, with products exported to almost 200 countries. Canadian farm incomes also continue to hit new records. Net cash income is expected to close out 2015 at a record $15 billion and remain strong in 2016.

In the medium term, economic growth in the developing world is expected to improve, supporting the expansion of the world's middle class and likely resulting in increased global demand for Canadian agricultural products abroad. The Canadian agriculture and agri-food industry needs to be ready and well-positioned to take advantage of new and emerging opportunities both internationally and domestically.

Despite the strong performance of the sector, volatility and risk remain a key challenge. Global commodity prices fluctuate while extreme weather and climate change alter landscapes and interrupt production. The preferences of Canadian consumers and international buyers are changing and the sector must adapt to higher expectations for transparency and product attributes.

Developing a New Policy Framework

For nearly 15 years, federal, provincial and territorial (FPT) governments have relied on agriculture policy frameworks to ensure a collaborative approach that encourages investment, adaptation and sustainable growth in the sector. With the current framework set to expire in March 2018, FPT Ministers are committed to maintaining the coordinated approach and build on past successes in the development of a new agricultural policy framework.

Past frameworks focused on building a competitive, profitable, innovative and environmentally sustainable sector. Over time, framework policy priorities and program delivery approaches have evolved. FPT governments recognize that flexibility across Canada and collaboration with industry have enabled FPT governments to meet diverse regional needs while supporting common national outcomes.

Building on the lessons of past frameworks, the Next Policy Framework (NPF) will further enhance policy and regulatory coherence and set clear FPT objectives across the country in support of the sector.

Overarching Objectives of the Framework

FPT governments and industry share a collective vision of creating the most modern, sustainable and prosperous sector in the world. Through the NPF, FPT governments will collaborate with industry to drive the sustainable growth, innovation and competitiveness of the sector.

This will be achieved by:

- Expanding domestic and international markets and trading opportunities for the sector;

- Enhancing competitiveness and strengthening competitive advantages by advancing science and innovation capacity and encouraging the adoption of products, practices and processes;
- Anticipating, mitigating and responding to risks in a manner that supports the sustainable growth of the sector;
- Supporting the resiliency and environmental sustainability of the sector to ensure long term adaptation and growth;
- Improving the growth of the value-added agriculture and agri-food processing sector; and
- Securing and growing public trust in the sector.

The framework will enhance coherence across FPT governments including flexible and transparent policies and program approaches with clearly defined, measurable targets and outcomes for the sector and Canadians.

Principles

In developing the NPF, Ministers expect that the following broad principles will be respected and incorporated into draft agreements:

- Policy and program priorities will be measurable and coherent and will demonstrably contribute to clearly defined FPT outcomes.
- Governments will work to ensure stability and continuity between frameworks, reduce disruption and improve efficiency and program results for industry, sector stakeholders and Canadians.
- To respond to changing needs for growth and innovations in agriculture, food production and processing, provinces and territories will have flexibility in the use of the funds and programs in the next agriculture policy framework.
- Collaboration among stakeholders is a key factor in achieving success. All parts of the sector have a role to play in contributing to the sustainable growth, adaptability and prosperity of the sector.

- Policies and programs will not distort comparative advantages among provinces and territories.
- Programs will be designed to respect Canada's international trade obligations, seek to reduce trade and production distorting support and minimize the risks of adverse trade action, including countervail.
- Shared jurisdiction for agriculture will be respected as well as the roles of federal, provincial and territorial governments.
- Governments will establish mechanisms to manage costs and sustain program affordability for FPT partners over the duration of the framework.
- The current 60:40 federal/provincial and territorial cost-share ratio will be respected by governments.
- FPT governments commit to transparent approaches that enable information sharing on program performance.

Results

Ministers are committed to supporting the sustainable growth, adaptability and prosperity of the sector in a manner that also demonstrates the value of investments to Canadians.

In this context, the NPF will include a strengthened focus on results by:

- Clearly defining the objectives and anticipated results, outcomes and reporting mechanisms for policies and programs;
- Ensuring that data/information collection activities are robust and that data sharing among FPT governments contributes to developing meaningful performance and results information;
- Emphasizing openness and transparency in communicating performance, information and results that enable governments and industry stakeholders to understand the successes and lessons learned in order to make informed decisions and take action; and

- Focusing on continuous improvement of policies and program delivery and ensuring governments are committed to sharing the performance information and results needed to meet the needs of stakeholders.

Priority Areas

To support the sector's long-term prosperity and enhance FPT government policy and program coherence, the NPF will focus on the following priority areas:

Markets and Trade

Today's globalized marketplace creates both new opportunities and challenges for the performance and sustainable growth of the sector. To achieve growth both in domestic and international markets over the long-term, the sector must adapt to this changing global environment and stay ahead of its competitors.

While Canada continues to open new prospects through trade agreements and works effectively to maintain and enhance market access, there remain obstacles to capitalizing on market opportunities such as non-tariff trade barriers and the need for adapting products for international markets. Overcoming these obstacles requires an ability to build on domestic strengths, create the conditions to attract investment in the sector, enable internal and foreign trade and pursue domestic and global regulatory cooperation, while continuing to preserve the integrity of the supply management system. Strong FPT collaboration, with stakeholders, underpins success and growth in all of these areas.

The NPF will facilitate the maintenance and expansion of domestic and international markets and enhance the ability of the sector to seize and diversify market opportunities by:

- Facilitating industry's capacity to develop market opportunities, at home and abroad, by providing support and tools needed to bring products to market and promoting/ leveraging Canada's reputation for quality and safety;

- Recognizing the importance of business development activities and opportunities;
- Addressing market access challenges to pursue and capitalize on new opportunities and maintain access to existing markets; and
- Strengthening relationships multilaterally and bilaterally to advance priorities for Canada including a stable global marketplace supported by predictable, science based international standards and trade rules.

Science, Research and Innovation

In an increasingly globalized industry, where Canadian farmers, food processing and agri-based companies rely on Canadian and global value chains, innovation is key to the sector's competitive advantage and economic prosperity.

Governments, industry and academia have a role to play in identifying innovation priorities and contributing to the research, development and knowledge transfer activities that are instrumental in enhancing sector resiliency, improving sector productivity and accelerating the commercialization of products with new and improved attributes.

The NPF will commit to continued support of agriculture, agri-food and agri-based products research and science, research and innovation at all stages of production and processing, including research-supporting regulatory systems. These efforts will contribute to continued productivity growth, position the sector for greater domestic and international competitiveness, and support the ability of the sector to adapt to environmental challenges.

The NPF will focus on accelerating science, research and innovation to support the sector by:

- Strengthening science, research and innovation capacity to address fundamental challenges such as environmental and market pressures;
- Enhancing knowledge and technology transfer activities to help farmers, food processors and agri-businesses commercialize and adopt innovative products and practices;

- Supporting research activities in areas that require sustained commitment, while ensuring flexibility for governments to respond to emerging priorities and sectors; and
- Continuing to encourage industry leadership and participation in collaborative research, development and knowledge transfer activities.

Risk Management

The sector faces significant risks such as extreme weather events, disease/pests and market volatility. These risks can cause severe losses and threaten the viability of businesses. Effective risk management, mitigation and adaptation includes surveillance activities, early identification of emerging risks; fostering solutions through science and innovation; growing and diversifying markets; effective assurance systems; strong regulatory approaches; and effective business management practices including the use of private and public-sector financial instruments. Together, these approaches enable growth and stability, stimulate investment and ensure confidence in the Canadian agriculture supply-chain.

Producers, processors, and all industry participants need to implement proactive strategies to help prevent and mitigate against events that impact sustainability and competitiveness in the sector. Governments have a role in helping industry coordinate and integrate prevention and mitigation, preparedness, response and recovery activities to maximize the resilience of the sector.

The NPF will continue to focus on enabling risk management actions and facilitate a resilient sector by:

- Ensuring that producers continue to have a suite of Business Risk Management (BRM) programs that are comprehensive in scope and effective in helping manage the impacts of production losses, severe market volatility, extreme events and disasters while seeking to improve participation, timeliness, simplicity and predictability;
- Promoting development of private sector risk management tools;
- Recognizing that for some sectors, supply management can be considered a business risk management tool;

- Supporting collaborative emergency management initiatives and risk assessment activities; and
- Ensuring FPT governments monitor risk management programs to ensure they are working as intended and are contributing to the vision of a sector that is competitive, innovative and adaptable.

Environmental Sustainability and Climate Change

Collaborative FPT action related to environmental sustainability and climate change adaptation and mitigation improves the sector's ability to manage risks, enhances productivity and contributes to economic growth. It also builds public confidence in the environmental performance of the sector.

Support for environmental sustainability initiatives under the NPF will help the sector to address agriculture's impacts on Canada's natural resources, reduce greenhouse gas emissions, and mitigate and adapt to the anticipated impacts of climate change (e.g., changing growing conditions, extreme weather events, reduced water availability/quality, soil degradation and new and increased pests and disease outbreaks).

The NPF will facilitate clean growth while achieving progress on environmental sustainability and climate change mitigation and adaptation. The NPF will help address diverse regional, provincial, territorial and national agri-environmental priorities and support efforts to capitalize on possible opportunities including:

- Enabling the sector's capacity to mitigate greenhouse gas emissions and adapt to climate change;
- Encouraging innovative approaches to address agri-environmental issues and knowledge transfer;
- Addressing persistent provincial, territorial and regional agri-environmental issues;
- Supporting the sector's ability to demonstrate sustainability in a changing domestic and global context; and

- Strengthening information collection, measurement and communication among FPT governments on environmental actions taken by the sector and resulting impacts on sustainability.

Value-Added Agriculture and Agri-Food Processing

Canada is well positioned to take advantage of new market opportunities resulting from growing global demand for food and other agriculture products, the access offered by trade agreements and shifting consumer preferences.

The food processing sector is Canada's second largest manufacturing industry, the largest manufacturing employer, and a major buyer of Canadian primary agriculture production. As a key component of the Canadian economy, the growth of the value-added agriculture and agri-food processing activities will be important in supporting the sector.

The NPF will support the continued growth of the value-added agriculture and agri-food processing sector and work to capture opportunities and address challenges by:

- Supporting targeted actions that leverage industry investments to increase productivity and competitiveness;
- Continuing to support the development and adoption of assurance systems;
- Enhancing public and private innovation capacity to increase the industry's development and adoption of new technologies, processes and products to improve sustainability and efficiency and meet evolving global consumer demand; and
- Providing market access and development support for companies pursuing domestic and export markets and new growth areas.

Public Trust

Canada's agricultural sector is one of the most respected in the world. An efficient and effective regulatory framework, assurance systems, government programming and value-chain collaboration work to support the sector's ability to produce food and agri-food

products in a responsible and sustainable manner. This has helped to build public confidence in Canada's agriculture and agri-food system and contributed to the long-term resilience of the sector.

Canada's reputation cannot be taken for granted as citizens and consumers are increasingly conscious of the environmental, animal welfare, health and safety considerations related to agriculture agri-food products. To continue to support competitiveness, while meeting expectations both in Canada and abroad, industry has to examine new and effective mechanisms to engage and respond to domestic and international consumers and citizens.

The NPF will continue to encourage and support collaborative sector efforts to enhance public trust by:

- Examining how government programming can help reinforce confidence and public trust in the sector;
- Ensuring the quality of Canadian and imported products (reciprocity of standards) and the strict controls to which all foods are subject;
- Supporting industry's ability to adapt and improve practices;
- Supporting the capacity of the sector effectively to anticipate and respond to evolving public demands and manage emerging risks; and
- Sharing the story of the importance of the sector and the modern, responsible and sustainable practices it uses.

Consultation and Engagement

Ministers commit to undertaking open, accountable and transparent engagement and consultation activities throughout the development and duration of the NPF. Consultation and engagement activities will ensure Canadians can share their experiences with the current GF2 framework and help FPT governments identify priorities and objectives for the NPF.

This approach will ensure that stakeholders from all parts of the agriculture and agri-food value chain, consumers, and Canadian citizens are able to provide their perspectives on the policies and programming that enable our sector's success, as well as the emerging challenges that the sector may face.

By ensuring that a wide variety of views are heard and taken into account, FPT Ministers will be able to position the NPF to build on the success of the agricultural sector and contribute to broader economic prosperity for Canadians.

Conclusion

Federal, provincial, and territorial Ministers of Agriculture commit to working together to enhance the sector's ability to compete, innovate, capture new opportunities, cultivate public trust, respond to new consumer demands and grow sustainably. These efforts will ensure that Canada's agricultural sector advances, grows and prospers and continues to be a cornerstone for the economy and for Canadians.

Ministers expect that the directions laid out in this document will lead to the development of a new framework that will build on the longstanding, successful and collaborative relationship between governments and industry.

Ministers ask officials to return with a draft multilateral agreement that will articulate in greater detail how governments will work together to achieve the objectives set out in this document.

Ministry of Agriculture
BRIEFING NOTE FOR MINISTER FOR INFORMATION
Terry Michell of Michell's Farms

Ref: 184550 Date: July 26, 2016

Issue: Terry Michell (Vancouver Island regulated crops marketing agency president and vegetable producer) called MO to discuss BC Vegetable Marketing Commission (BCVMC) issues and the regulated produce industry on Vancouver Island (VI).

Background:

- BCVMC acts by the authority delegated through the *Natural Products Marketing (BC) Act* (NPMA) and its Regulations (General Order), and BCVMC decisions are subject to the supervisory and appellate functions of the BC Farm Industry Review Board (BCFIRB).
- BCVMC provides for orderly marketing in the vegetable industry for specific crops in the areas of greenhouse vegetables; processing vegetables; processing strawberries; and storage crops.
- In 2009, the use of districts to constrain producers to signing up with an Agency within a district was removed from the General Order leading to Agencies competing with one another for supply share province-wide and producers able to market through any licensed Agency that they choose.
- Vancouver Island is saturated with three Agencies, licensed by BCVMC, competing for producer supply and market share to market conventional storage crops: Island Vegetable Co-operative Association (IVCA), Vancouver Island Farm Products Inc. (VIFP) and VIP Produce Ltd. (VIP). By contrast, there are two Agencies for the rest of BC (BC Fresh Inc. and Okanagan Grown Produce Ltd.) and one specialty Agency (Fraserland Organics Inc.).
- Since VIFP was granted agency status by BCVMC in 2013, there has been buyer confusion and ongoing disputes between island producers, Agencies and BCVMC regarding rules governing Delivery Allocation (DA) - a tool to control the flow of product from producers to the marketplace.
- BCVMC's attempt at addressing abuse of DA rules by passing an amendment to the General Order failed due to a successful challenge to BCFIRB by IVCA.
- BCFIRB's lengthy review of a previous Island Agencies' dispute (BN#182162) has provided a forum for VI producers and Agencies to express frustrations and concerns with BCVMC governance and consultation with members regarding regulatory decisions.
- In September 2015, in an effort to resolve ongoing issues related to regulated vegetable production on VI, BCVMC undertook a Supervisory Review of the Future of Regulated Marketing on VI (Supervisory Review) including stakeholder consultation and a final report completed in January 2016.
- On June 8, 2016, BCVMC presented a Decisions and Recommendations Report to BCFIRB.
- Terry Michell, VI regulated vegetable grower and president of IVCA, has contacted the ministry to express concerns regarding the BCVMC decisions and recommendations to BCFIRB, the objectivity of the consultation facilitator, and the dominance of BC Fresh Inc. in the regulated marketplace and the governance structure of BCVMC.

Discussion:

- The removal of districts in 2009 was not accompanied by Order changes to Agency Licensing or DA rules creating a situation where Agencies and producers are now in competition for marketshare, and DA rules are being circumvented by producers and Agencies.
- Examples of DA failure reported in the Supervisory Review report (BCVMC, January 2016):
    - producers switching to a new Agency allowing producers to grow in excess of their historic DA;

    - producers transferring their DA to another producer and then continuing to deliver to the marketplace using direct channels that bypass the Agency;
    - Agencies marketing product from member producers that is in excess of their DA.
- The cause of the problems can be attributed to the notable failure of the BCVMC to effectively administer the General Order (Regulations).
- BCVMC's attempts to address the problems have failed and have resulted in challenges by island producers, Agencies and BCFIRB leading to mistrust, confusion and inconsistency.
- From a 2016 workshop, producers and Agencies saw value in a regulatory framework; however, the facilitator indicated that certain individuals and Agencies are challenging the system, putting in jeopardy the collective interest of the industry.
- BCVMC's decisions and recommendations to BCFIRB include:
    - BCVMC to develop an updated strategic plan for the storage crop sector;
    - Overhaul of DA Orders;
    - Continued regulation of the VI vegetable industry;
    - Each VI Agency to submit an application requesting agency status for the 2017 crop year;
    - BCVMC to recommend VI Agency status to BCFIRB based on sound marketing policy regarding the number of island Agencies needed.
- Michell expressed concern with the Supervisory Review suggestion that VI growers are not following the rules and that BCVMC recommend all VI agencies reapply for agency status for the 2017 crop year.
- BCVMC recommendations to BCFIRB are based on findings of the consultation facilitator and Michell questions his objectivity claiming the facilitator has a business history with members of BC Fresh Inc.
- Michell reports that the Lower Mainland Agency, BC Fresh Inc., is competing with VI Agencies by marketing regulated product to VI markets below regulated prices.
- Michell also raised concerns about BCVMC governance – specifically, over-representation by BC Fresh Inc. on its board relative to IVCA presence and the resulting influence on BCVMC decisions.

Suggested Response:

- AGRI does not have a role to play in addressing disputes between regulatory organizations.
- BCVMC has made recommendations to BCFIRB regarding storage crop regulation on VI based on a Supervisory Review, and is now awaiting BCFIRB's response.
- AGRI staff will encourage BCVMC to follow BCFIRB directives or conditions upon their review of BCVMC decisions and recommendations from the Supervisory Review.
- Remind the meeting participants that both BCVMC and BCFIRB play an oversight role in ensuring that Agencies operate in accordance with the BCVMC General Order, and with good governance to deliver sound marketing policy in the broad public interest.
- Remind the meeting participants that the front line role of the Agencies is to ensure that marketing is conducted in an orderly fashion according to the BCVMC General Order.

Contact: Susan Smith, Industry Specialist, Field Vegetables and Organics, 604 556-3087

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Ministry of Agriculture
BRIEFING NOTE FOR MINISTER FOR INFORMATION

Ref: 184739 Date: July 7, 2016

Issue: Update on four Salmon farm relocation sites.

Background: Forest Lands and Natural Resources staff have issued notices of final review, i.e. "tenure offers", on four sites under the relocation provisions of the aquaculture operational land use policy, section 3 of Appendix II and consistent with the September 30, 2015 update to industry. The relocations sites are:

1) Cougar Bay to Marine Harvest and the Kitasoo in the Central Coast;
2) Alexander Inlet to Marine Harvest and the Kitasoo in the Central Coast;
3) Minstrel Island/Tsa-ya for Greig in the Broughton Archelpelago; and
4) Robertson Island for Marine Harvest in Queen Charlotte Strait.

First Nations Consideration: The relocations sites for the central coast and Broughton sites have the approval of First Nations in whose traditional territory they are located. The Minstrel Island relocation addresses FN opposition to the Cliff Cove site it replaces.

Discussion: On September 30, 2015 the Ministry of Agriculture provided an industry update that confirmed the following:

- The Province, through FrontCounter BC, will continue to receive applications for new salmon aquaculture operations. However, the Province will not be reviewing the applications at this time.
- The Province will accept and review for decision any applications looking to amend an existing tenure in support of improvements to safety or operational management and efficiency.
- In addition, the Province will also accept and review for decision applications to relocate an existing tenure to a more suitable location if the operations remain consistent.
- The BC government will not be reviewing any other type of applications for an amendment to an existing tenure

The information on the four sites aligns with the information that the Ministry provided to the industry. The first two sites have conditions contained within the tenure documents that require two corresponding sites (Jackson Passage and Lochalsh Bay respectively) be closed by specific dates that allow Marine Harvest to complete the current grow-out cycle. One site will be closed by the end of 2016, the other within the first 6 months of 2017. The third site (Minstrel) has a condition in the offer that requires the corresponding site (Cliff Cove) to be closed before we will issue the tenure documents. Grieg is currently working on these requirements. The Minstrel site was opposed by shrimp trawl fishermen and that information was considered by DFO in their decision process. The fourth site, Robertson Island, was an existing site. Marine Harvest was allowed to apply for an amendment using the relocation provisions; they are completing closure requirements on the existing site prior to final approval of the tenure.

The issuance of aquaculture licences by Fisheries and Oceans will be co-ordinated with tenure issuance and is expected within two weeks.

Conclusion: The relocations are consistent with operational land use policy and with the industry update.

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Ministry of Agriculture
BRIEFING NOTE FOR MINISTER FOR INFORMATION FOR MEETING
with the BC Chicken Growers' Association, July 28, 2016

Ref: 184742 Date: July 26, 2016

Issue: A meeting request from the BC Chicken Growers' Association with the Minister to discuss chicken farmer pricing of product and the structure of the BC Chicken Marketing Board.

Background: The BC Chicken Growers' Association (BCGA) was founded in 1957 to unite commercial chicken growers in BC and work towards a more stable industry. The BCGA acts as a liaison between the chicken growers, other areas of the chicken industry and government. There are 10 directors on the BCGA Board of Directors that represent the approximate 340 producers in the three regions of the province, two from Vancouver Island, two from the Interior and six representing the Lower Mainland.

The BC Chicken Marketing Board (BCCMB) sets the price that producers receive for their chickens. The formula by which price is set is reviewed from time to time and the BCCMB recently announced that it is undertaking a review (June 20, 2016). The BC Farm Industry Review Board (BCFIRB) set out the following principle for how best to determine the price a grower receives for their chicken from a processor:

> *A workable pricing model must be consistent, predictable, transparent, and result in a live price that gives growers a reasonable return and allows processors to be competitive in the Canadian market.*

The two key stakeholders, the chicken growers and the primary poultry processors, have competing interests. The chicken growers have been citing deteriorating margins, due to increasing costs and prices that have not increased for their product, while the processors are faced with increasing competition from product from Central Canada due to their lower costs of production.

Due to turmoil through the 1990's and early 2000's, the Province changed the five member BCCMB composition from a majority of chicken grower members, to a majority of government-appointed members, including the Chair.

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