



KASLO/RDCK AREA D PARTNERSHIP

Climate Change Adaptation & You



Appendix G - Project and Area Information

Project background

In 2009/10 Columbia Basin Trust continued its commitment to enable communities within the Columbia Basin to prepare climate change adaptation strategies, with joint funding of 3 projects to form Phase 2 of their 'Communities Adapting to Climate Change' initiative:

1. Kaslo/north Kootenay Lake, Lardeau and Duncan Valley areas (Area D) –
'Kaslo/Area D Climate Change & You'
www.rdck.bc.ca/adaptation
2. Castlegar
'A sustainable Castlegar'
<http://castlegar.ca/sustainable>
3. Rossland.
'Vision to Action'
<http://www.visionstoaction.ca/>

Castlegar

The City of Castlegar has identified municipal infrastructure as a key priority for climate change adaptation. Working in partnership with Engineers Canada, the City will conduct a vulnerability assessment for the storm water system to identify monitoring and management actions needed to ensure climate resiliency.

Because food security has been identified as a critical issue for the community, the City will also be exploring the resiliency of Castlegar's food system to climate changes, as well as establish a process to enable the community to identify a third impact area for further investigation. The City of Castlegar is also strategically exploring sustainability and will integrate climate change adaptation and mitigation into the concurrent Official Community Plan update.

Rossland

The City of Rossland's Sustainability Commission is focusing on climate change adaptation through a socio-economic lens to identify key vulnerabilities and opportunities for Rossland's local economy in the next forty years. Rossland has partnered with Simon Fraser University's Adapting to Climate Change Team

(ACT) to conduct research for their adaptation project. Rossland's local adaptation steering committee is working closely with all parties including the Sustainability Commission, to help guide the process.

The 9 month project in Kaslo/Area D was co-funded by Columbia Basin Trust (CBT) and the Regional District of Central Kootenay (RDCK) in order for a Climate Change Adaptation Strategy to be developed.

Phase 1 were climate adaptation projects in the East Kootenay communities of Elkford www.elkford.ca/ and Kimberley www.city.kimberley.bc.ca/

These projects run in conjunction with the CBT funded Kootenay Carbon Neutral Strategy and Corporate Emission Reduction projects.

The 9 month project in Kaslo/Area D was co-funded by Columbia Basin Trust (CBT) and, Regional District of Central Kootenay (RDCK) and Kaslo Village in order for a Climate Change Adaptation Strategy to be developed.

These projects preceded the Tri-regional district/CBT funded Kootenay Carbon Neutral Strategy which addresses Corporate Emission Reductions. Alongside the community projects is an adaptation learning network for Basin local governments and technical support members that come from across BC and beyond. Kaslo/RDCK took part.

Columbia Basin Trust (CBT) is committed to taking action on climate change and actively engaging with people living in the Columbia Basin. CBT will continue to act as convener and facilitator and support existing and emerging climate change initiatives as part of its long-term commitment to support people in the Columbia Basin to achieve social, economic and environmental well-being and self-sufficiency for present and future generations
(CBT website)

'Climate Change Adaptation & You' project is an extension of intent from the Kaslo OCP Policy area 17 'Energy and Climate Change', specifically 'The requirements of the Climate Change Adaptation Strategy are a necessary consideration of the Kaslo Integrated Community Sustainability Plan (ICSP).' 17.2.2, and follows a commitment to a greenhouse gas reduction target via a Sustainable Kaslo plan.

The Regional District of Central Kootenay's commitment to sustainability and sustainable communities is demonstrated by its current programs, outlined below.

Study Area

The study area was the northern part of Kootenay Lake, Lardeau and Duncan Valley areas in RDCK Area D, West Kootenay, BC.

Study approach

The co-funded CBT/RDCK/Kaslo project took the lead from its Steering Committee, and drew expertise from the CBT Technical Support Team, Selkirk College, Kaslo public works and the public. The Project Coordinator took responsibility for organizing the Steering Committee, all meetings, project research and the final report. Budget arrangements were looked after by the RDCK.

Kaslo/Area D information

Project Area (based on text from 'Regional District of Central Kootenay, Kootenay Lake, Lardeau and Duncan Valley portion of Electoral Area 'D' Official Community Plan bylaw no. 1996, 2009')

Historical Context

Most of the communities within the Plan area were settled during the mining boom of the 1880's and 1890's. Some were active mining communities, while others grew as saw mill and railroad communities or sternwheeler landing points to supply goods and services and pick up ore and produce. When the mining boom waned during the early 1900's some communities were abandoned, while others were promoted by the rail companies for fruit growing and resort development. Sternwheelers continued to be an important form of transportation to the area until 'The Moyie' was retired in 1957.

In 1965, construction started on the Duncan Dam, the first dam under the Columbia River Treaty. This resulted in some communities (Howser) being relocated as a result of changed water levels and diversion.

Communities in the area continued to be orientated toward the natural resource industry and the economic boom and bust cycles associated with such resource dependency. The isolated nature of the area ensured development pressure. Growth remained minimal and northern portions of the Plan area continued to receive Isolation Allowance up until the 1990's.

Recent trends in the area have shown an increase in amenity migration, or the movement of people into the area for its natural and recreational amenities. The increased ability of being able to work at a distance from places of employment (partly due to the internet), recreational home ownership, an aging and mobile population, and a more diversified economy have all resulted in specific types of development pressure in the area similar to most mountain communities within the Kootenay Rockies.

Geographic Context

Total population: Area D 1525, Kaslo 1073, total 2600

Land area: Area D 5,788.48 km², Kaslo 2.8km², total 5791.28 km², 26% of the Regional District of Central Kootenay.

Private households: Area D 710, Kaslo 480 (occupied) Total dwellings 1190

Regional District population: 56481

Area D/Kaslo share of Regional District population: 4.6%

Percent change '01-2006 Area D +1.7%, Kaslo +3.9%, Kaslo/Area D 2.6%

Statistics Canada 2006 census data

(www.bcstats.gov.bc.ca)

The communities and residents of North Kootenay Lake, the Lardeau and Duncan Valleys have inevitably been influenced by the challenging geography of place. Situated in a narrow valley between the Purcell Range in the east and the Selkirk Range to the west, settlement has been confined to valley bottoms. Historically transportation goods and service routes have (other than by walking and pack trails), by necessity, been linear in nature and communities relied on the railways and sternwheelers. Today, these old rail lines and sternwheeler routes have been abandoned and replaced with Highway 31 along the western shore of Kootenay Lake and north to Trout Lake, and Highway 31A from the Village of Kaslo west to New Denver.

Residents and visitors must travel to the area as a destination and its relative isolation provides a challenge to economic diversification and sustainability. The natural environment has shaped the self-sufficient culture of many of the communities in the Plan area and is what attracts people to live and visit the area. The challenge of the physical environment, however, leaves many communities vulnerable to loss of services, the boom and bust economics of resource dependency, and isolation.

Growth in the area has historically been slow and followed the pattern of the economics of the region being tied to the natural resource industry. In 2006, the population of the area was estimated to be 2,600 persons residing in 1,473 dwellings according to census data. Part-time residency (potential holiday homes), based on non-resident property ownership, was approximately 19.3% that year. Increasingly, new development has been oriented toward recreational properties, while full-time residency has experienced resurgence due to an increased number of retirees, employment no longer being tied to location due to increased communications, and diversification toward tourism and recreational

related employment. The attractiveness of the area, its isolation, and opportunities for a self sufficient lifestyle are some of many reasons that people reside here. It is an area where the physical geography of place still dominates and provides challenges to those who choose to make their home here. It is important to residents of the area, that the natural and cultural values that shape the area are maintained, while a strong and diversified economic future is developed.

While old orchards still exist, and there is interest in rural and self sufficient lifestyles including animal husbandry and gardens, commercial agriculture has declined. The attachment to the landscape and rural living is reflected in the community groups existing in the area. The vast majority rely solely upon volunteers and dollar donations. The biggest obstacle to expansion of commercial agriculture is the price of land and the inability of those who wish to farm to buy it.

Community and Population

The total population of Area D is 2,600 (2006 census data), representing a little over 2.7% of the Kootenay region population. Nearly 70% of the Area's population is centred around the village of Kaslo (1,072, 2006 census data), the remainder being distributed in settlements such as:

Howser, Meadow Creek, Cooper Creek, Argenta, Lardeau, Johnson's Landing, and Ainsworth.

The 2006 Kaslo census identifies the fact that 79% of the residential homes were constructed prior to 1986, with 11.5% in need of 'major' repairs. This should be considered when looking at adaptation to climate change with respect to funding the necessary changes, e.g. insulation, energy efficiency, water conservation, etc due to the varying condition of the housing stock and incomes.

The Village of Kaslo is working on a population growth of 2%, while the Regional District has a slightly lower figure of 1.5%.

Services Supplying Kaslo/Area D

Water

Due to the nature of development in the Plan area, much of the natural environment has remained un-fragmented and relatively intact in the higher reaches of mountain systems, while portions of the valley have been historically flooded or modified as part of the Columbia River Treaty. The conservation values of the Purcell Wilderness Conservancy, Goat Range and Kokanee Glacier Provincial Parks, and the multitude of smaller ecological sites and protected areas, contribute significantly to the local inventory of large natural space and the aesthetic qualities of the landscape. There are significant wildlife corridors and habitat values that have been identified as significant in the Plan area, as well as fisheries values in association with the lakes and larger river systems in the

northern extent of the Plan area. This landscape has encouraged the development of many small water user systems.

Utility services in Kootenay Lake and the Lardeau Valley include the provision of water supplied by the Woodbury, Fletcher Creek, Mirror Lake, Pineridge, Schroeder Creek, Woodbury and Howser community water systems for domestic purposes. MacDonald Creek (Allen Division) is a Regional District service with water supplied by the Village of Kaslo, while Fletcher Creek is an Improvement District.

All other water systems in the Plan area are either privately or community owned and operated. Water supply and distribution in Kootenay Lake and the Lardeau Valley communities, including those with community water systems, primarily depend upon surface water and well water, with some obtaining water from Kootenay Lake (Woodbury and Pineridge) or Duncan Dam (Howser). Water systems and individual water sources are vulnerable to drinking water advisories, or over subscription of water resources. Areas that require water for both domestic and irrigation purposes can be especially vulnerable.

Only Kaslo has a publicly owned sewage service in the Plan area. Septic, and more recently, package sewage treatment plants, are the predominant form of sewage treatment. Refuse disposal for the area is provided at the regional transfer facilities west of the Village of Kaslo and at Marblehead north of Meadow Creek.

Access to and use of clean water is an essential component of a sustainable community. This remains a challenge for many users in Kaslo/Area D, especially when climate change is considered and how it will affect future provision. This project looked into how future climate change would impact the watersheds which supply the creeks from which the vast majority source their water.

Water users in Area D / Kaslo

Community	Approx numbers	Water type	Main water source	Water user group
Ainsworth	50	Only Hot Springs treated, rest untreated		
Kaslo/Allen subdivision	1100	Treated	Kemp Creek, Kaslo Reservoir (backup)	Kaslo village
Mirror Lake	100	Boil water advisory (BWA)	Bjerkness Creek	Mirror Lake water users group

Kaslo south/Pine ridge	50	Individual, no treatment	Wells Lofstedt Creek,	Kaslo south area water society
Pine Ridge	50	Treated	Kootenay Lake	Pine Ridge Comm.
Fletcher Creek	50	BWA	Fletcher Creek	Fletcher Creek community
Woodbury Village		Treated	Kootenay Lake, Woodbury Creek	Woodbury Village community
Shutty Bench	100	Individual, no treatment	Wells Kootenay lake, various	
Schroeder Point	50	Treated	Schroeder Creek	
Lardeau	100	Well untreated	Davis Creek	Lardeau Water Users Group
Meadow Creek		Individual no treatment	Wells Meadow Creek	
Howser	10	Individual no treatment	Duncan Lake	
Boyd/Hamill Creek		Individual no treatment	Hamill Creek Wells	
Argenta		Individual no treatment	Argenta Creek, Carter Creek,	
Bulmers Pointe		Treated	Bulmers Creek	
Johnson's Landing		Individual no treatment	Kootenay Joe Ck, Gardener Ck, Gar Ck, 1 well	

Electricity

All the electricity in Kaslo/Area D is provided by FortisBC, including a contract with BC Hydro for the Lardeau Valley , there being a few properties, particularly in the north of the area off the grid, relying on power generation by alternative methods (pelton wheel, solar/diesel). The power lines mainly follow the main road routes and are constantly under threat of damage from weather related events, e.g. windthrow, snow.

BC Hydro's electrical system in the province consists of nearly 75,000 km of transmission and distribution lines. Much of this infrastructure, covering 94% of the province, is located in mountainous and tree-covered terrain, making it

vulnerable and subject to both natural and human impacts. Storms cause outages through wind, ice and snow and through tree branches contacting lines. As a result, a change in the frequency of extreme weather events will affect power reliability.

Jennifer Walker-Larsen, Stakeholder Engagement Advisor, BC Hydro

Fortis BC has undertaken a substantial supply line upgrade and do not presently incorporate any climate adaptation planning into their strategic long term thinking (*phone conversation with Barry Smithson, Director of Network Operations, Fortis BC*).

Roads

Access to Kaslo/Area D is mainly from the south along Highway 31 (Nelson). Most services which require road transport access the area this way. The access from the north from Howser/Lardeau is gravel. Highway 31A from the west (New Denver/Slocan Valley) is a mountain pass.

Several areas are identified as slide hazard and non-stand flooding and erosional areas, which make road access vulnerable to rock, mud and snow slides. Road closures are not uncommon, affecting emergency access and food supply. Highway 31, north of Kaslo, is used for commercial transport of commercial logs and wood products from Copper Creek and Meadow Creek and logging in the Lardeau and Duncan Valleys and to access recreational fishing, hunting, camping, skiing, 4x4 vehicles, snowmobiling and mountain climbing.

There is one major RDCK-identified slide hazard area before and at Ainsworth Hot Springs, with numerous identified flooding and erosional areas along the north/south Highway 31 corridor and the east/west Highway 31A pass. During the winter, slides are commonplace and can also occur during extreme weather conditions, e.g. rainstorms. These known hazards, coupled with power lines following similar routes, mean that the area as a whole is at risk at any time of any number of natural hazards. Anecdotal evidence has provided the following information as regards to areas at risk of landslides/flooding

Slides that have closed the highway or took out power:

- Lardeau bluffs (annually, usually snow avalanches)
- Lost Ledge Creek (debris flow) ~2000
- Shuttly Bench, south end (perennial slide across the highway, portion of road taken out ~2005)
- Several slide chutes along 31A between Kaslo and New Denver (usually snow avalanches)
- Perennial slide at Whitewater Creek
- Coffee Creek Bluffs and Ainsworth - Coffee Creek power line (snowslides and mudslides).

Floods that closed the highway or took out power:

- Meadow Creek area - Meadow Creek overflows the channel along the highway. Most years, some private properties are flooded.
- Hamill Creek ~2000. Forest Service road bridge blown out; private properties eroded.
- McDonald Creek (upper Kaslo), most recently in early 2000's, took out Hwy 31 - emergency program involved. It destroyed the collection infrastructure so Allen Subdivision is now on the Kaslo Water system.
- The area near Woodbury-Fletcher Creek Forest road, just south of Fletcher Creek
- Ainsworth, Coffee Creek