



## Chapter 2: Research Summary and Community Workshop Outcomes

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As noted in the introductory chapter, the CCAP study included a wide range of research methodologies and focus areas. Results and outcomes of the study were compiled and shared with community stakeholders and local leaders during community workshops held in Prince Rupert, Lax Kw'alaams, and Terrace. This chapter begins with a brief summary of the key research findings and outputs that were presented at the workshops, and concludes with a discussion of the workshop outcomes in each of the three communities. Further detail on each of the research components follows in subsequent chapters.

### 2.1 Summary of Key Findings and Study Outputs

#### 2.1.1 Valued Community Resources and Drivers of Change

Sociological research interviews conducted in each of the three participating communities provided the research team with important information about the perceived value and condition of a range of community and environmental resources. This work also gives insight into the unique perspectives and prominent issues in each community, and helps to place climate change within the context of local, regional, and global influences. The full results from the research interviews are included in Chapters 4 and 5 and accompanying appendices.

In the context of this study, it is interesting that a number of issues are perceived to be of greater influence for the future of the region than climate change. This does not mean that climate change is not important, but does highlight the fact that communities and leaders in the Northwest are focused on a number of other issues, many of which are perceived to be more imminent than the impact of climate change. Arguably, this may be due to the lack of local information that is available and the difficulty in quantifying the socio-economic impacts of climate change. In addition, the forest industry, once a mainstay of the region, is not only considered to be in poor and declining condition, but, with the exception of Terrace, is seen to be of relatively low importance for community well-being compared to other community resources. Concern over climate change impacts and forest resources is projected differently in each community and between individual participants. In Lax Kw'alaams, discussion of climate change is more often associated with concerns over local food availability and ocean resources, whereas in Terrace and Prince Rupert, concerns were often defined in relation to the impact of climate change on the resource economy, transportation and infrastructure. Even where climate change was not considered an imminent threat, there is significant concern about environmental change, natural resource sustainability, and in particular, the future of salmon. Additional key points are listed below:

- Salmon is ranked as the most important environmental resource for regional well-being, AND as the most threatened environmental resource that is also in declining condition, when results for all three communities are combined.

- In all 3 communities, every environmental resources included in the sustainability matrix is perceived to have declined in condition over the last 20 years.
- Forest industry, forest health and diversity, and timber supply are perceived to be in poor condition and declining in all three communities.
- Access to education and skills training is extremely important for the well-being of the region, and is perceived to be improving.
- First Nations treaty settlement is ranked as the number one driver of change across the region.
- Environmentally responsible economic diversification is a common vision among a large number of respondents.
- Uncertainty and economic pressures are a commonly cited as barriers to investing in climate change planning.
- There is a strong desire to see investment in small business development, especially in Terrace and Prince Rupert.
- There is a perceived need to strengthen regional collaboration and planning around a common vision for the future that includes economic investments and diversification, natural resource management, and environmental sustainability.

See community workshop presentations included as Appendix 2.1 (Lax Kw 'alaams), 2.2 (Prince Rupert) and 2.3 (Terrace).

### **2.1.2. Climate projections and vegetation modelling for the study area**

Researchers used the LPJ-GUESS dynamic regional vegetation model to simulate the potential impact of three different climate scenarios on tree species and ecosystem functions and services. In addition, three different future harvest scenarios were applied to each of the climate scenarios, to understand how and if harvesting could interact with future climate scenarios across the region. Information about the LPJ-GUESS model and methods used are described in Chapters 5 and 6 along with the complete set of modelling results.

#### *Projected Shifts in Temperature and Precipitation*

- The climate of the Skeena region will likely warm significantly and become wetter into the future.
- Precipitation patterns will likely shift to drier spring months with much wetter autumn months.
- The actual magnitude of the changes in temperature and precipitation are highly dependent upon emissions/model scenarios.
- Extreme precipitation events are likely to increase, primarily in the cold season months, while extreme minimum and maximum temperatures are also likely to increase into the future.

- Evidence from ecosystem studies suggests that this enhanced variability could have stronger impacts upon the ecosystems of the study region than any of the overall trends and shifts in annual values (Jentsch et al., 2008).

#### *Projected impact of climate change on vegetation and tree species*

- Common species in the study region, such as western hemlock and amabilis fir will likely become more dominant as the proportion of lesser species decreases.
- As the climate warms into the future, the areas of alpine tundra will likely become afforested, though the actual rate of colonization by trees is highly uncertain.
- In the lower elevation regions, the forest will likely experience increased growth due to CO<sub>2</sub> fertilization, increased moisture and higher growing season temperatures.
- Changes in the damage due to forest pests and diseases are highly uncertain but likely to increase into the future.
- The impact of extreme events on the forests is not adequately modelled in LPJ-GUESS and could result in higher mortality and extensive changes to forest composition.

#### *Carbon dynamics and future projections*

- The region has primarily acted as a carbon sink through the historical period and the region is expected to continue as a carbon sink until at least 2040 when it may become a carbon source, depending on the climate/emissions scenario we follow.
- The simulated variability in ecosystem carbon dynamics across the historical period is smaller than the spread of variability between the different climate scenarios.
- The influence of the spread in future climate scenarios is far greater than the influence of historical or estimated future harvesting, for the regions' carbon dynamics.
- The potential for natural fire disturbance increases in the future, in a small region of the eastern part of the study area. This increase would be similar to conditions in the past that led to higher fire activity during the period of 1906 – 1915.
- Increased harvesting is simulated to decrease the risk of fire by reducing available fire materials.
- Any attempts to manage the region's forests for carbon sequestration will become riskier into the future due to the large, and unpredictable, influence that climate and pests can have on forest ecosystems.

#### *Runoff*

- Changes in total annual surface runoff follow the projected changes in precipitation reflected in the climate scenarios.
- The major changes to surface runoff depict a possible decline in summer runoff and a significant increase in autumn runoff.

- The summer decline could result in lower river levels and be representative of higher moisture stress for vegetation in some parts of the study area.
- Higher autumn surface runoff likely indicates higher water levels in rivers and, combined with higher likelihood of extreme precipitation events, a greater chance of flood events.
- The influence of harvesting on surface runoff for the regional scale appears to be small but this result is unlikely to be applicable on a site-level, where other models, like the one used in the SRWCP, are more applicable.

### *Harvesting schedules*

- The historical and future harvesting scenarios simulated by LPJ-GUESS show a relatively modest influence on the region's runoff and carbon dynamics.
- On a regional scale, the influence of climate's inter-annual variability will have a much more significant impact than historical or future harvesting patterns.
- However, as noted above this does not mean that harvesting will not have significant impacts at the site-level and this requires the use of different tools and finer scale data to test.

**Note:** harvesting simulations do not evaluate harvesting impacts upon other parts of the ecosystem such as disruptions to wildlife, soil erosion, and changes in species diversity, wind speeds, or vegetation-atmosphere energy fluxes.

The workshop presentation for this component is included as Appendix 2.4.

#### **2.1.3. Fisheries sensitive watershed monitoring protocol and research component**

The Fisheries Sensitive Watershed Monitoring component of the study achieved a number of important results (See Chapter 9 for detailed information and accompanying technical reports ). The protocol was piloted in the Lakelse Lake watershed, an area of significant social, cultural, ecological, and economic value to the region. Throughout the course of the project, a number of local experts and government employees were trained in the protocol; building local capacity to engage in monitoring in the future. If implemented under an adaptive, integrated resource management framework, this protocol can be employed to assess the effectiveness of land-use practices and support new and improved approaches to management. The training, data collection, and protocol development process had a number of important findings for the Lakelse drainage including:

- The historical effects of poor logging practices, including the harvest of riparian areas, has had a long term negative impact on hydrology and stream health.
- Recovery can occur but in some areas is being further delayed by continued land-use, including harvesting, even where current practices meet legislative requirements.
- There is a need to assess cumulative impacts spatially and over-time, in order to facilitate recovery of non-functioning streams.

- Other industry and land-users besides forestry and oil and gas (such as energy, transportation, and mining) should also be required to abide by practices that protect water resources, in order to minimize cumulative effects and improve land-use practices.
- Poor stream crossings and culvert maintenance are negatively affecting the watershed.
- Climate change poses additional risks to stream health and function, many of which can be mitigated by adjusting land-use practices.
- Predicted shifts in the timing and levels of peak and low flows as a result of precipitation patterns are likely to increase the vulnerability of salmon.
- Options to improve resilience include: leaving wider riparian buffers in sensitive areas, consulting with local experts to determine high-value spawning areas and special measures, and monitoring culverts and road crossings to ensure they are functioning properly.
- Continued training and engagement of local stakeholders in monitoring protocols and to identify at-risk streams is necessary.
- Road building standards should be reviewed to ensure roads and crossings can withstand projected increases in runoff and precipitation associated with climate change.

The FSW presentation is included as Appendix 2.5.

#### **2.1.4 Skeena River Water Conservation Project (SRWCP)**

The Skeena River Water Conservation Project (SRWCP) is an independent project that shares a number of similar objectives with the CCAP, and evolved through considerable collaboration with the CCAP research teams. The SRWCP was designed to develop and test an approach for managing water values and resource development, using existing land management objectives and scenarios about possible future conditions. The cumulative effects analysis framework developed by Cortex Consultants uses a number of the hydrological indicators from the FSW monitoring component, in combination with land-use and climate scenarios, to help decision makers better understand the cumulative effects of operations that impact water resources and plan accordingly. This study complements the regional scale climate and vegetation modelling conducted as part of the CCAP project, by providing site-level analysis of broader trends. In addition, because the SRWCP framework used a different approach to modelling climate impacts than the CCAP project, there is a unique opportunity to compare these two methods and their respective reliability, as climate impacts are monitored into the future. At the time of the workshops, scenario outputs had not yet been released, however details about the cumulative effects framework are included in Chapter 10 and a full summary of the project can be found as Appendix 10.1. The final report for the SRWCP will be available in the summer of 2012 and will be made available via the project website.

Key findings and outcomes of the SRWCP include:

- Development of a unique planning tool to support adaptive integrated resource management, through predictive modelling and scenario-planning capacities.
- Improved capacity to understand site-level impacts of climate change and forestry on water resources and fish habitat in the Skeena region.
- Ready-to-use planning and modelling framework that can be adapted to include a range of land-use plans and industry operations, including run-of-river hydro, mining, and oil and gas in the Skeena region.
- Unique insight into regional issues and challenges through engagement with independent advisory group participants.
- Clearly voiced concerns over the lack of required community consultation for forestry operations, and confusion over the planning process.
- Identification of hydrological indicators and specific vulnerabilities of the Skeena watershed by local experts.
- Expert workshop provided a unique opportunity for local stakeholders and experts to exchange ideas and concerns about hydrological vulnerabilities, to better understand the regulatory systems governing resource use and planning in the region, and to identify possible next steps for improvement.

The SRWCP workshop presentation is included as Appendix 2.6.

## 2.2 Community Workshops

In December 2011, our team held workshops in each of the three communities where interviews had taken place: Prince Rupert, Lax Kw 'alaams, and Terrace. Every person who had been invited to be interviewed was also invited to attend the workshop. In addition, we also extended invitations to new members of the City and Band Councils, along with other community members who had not originally participated in the interview process but that expressed interest in the workshop. Although the sociological research content was specific to each of the communities, we did invite representatives from neighbouring communities. Unfortunately, none were able to attend.

The workshops were structured to share the findings, progress, and outputs from each component of the study with the community, and to provide a forum for discussion about adaptation as it related to both this new information, and their own personal and collective experiences, visions, and priorities. The goal of the workshops was to identify actions and next steps, as well as specific enablers and barriers to adaptation, and thereby build capacity among local leaders and stakeholders to engage in local and regional adaptation planning. In total, 170 invitations were sent out and 53 attended across the three communities; 19 in Prince Rupert, 12 in Lax Kw alaams, and 22 in Terrace.

While we had outlined a general process for the workshops, each one was slightly different and had to be modified according to the number of people in attendance, the range and number of issues and actions that participants wanted to discuss, and the preference of participants. In Prince Rupert and

Terrace participants were divided into different roundtables and reported their discussion back to the group, which then ranked the proposed actions according to those they most wanted to pursue. In Lax Kw'alaams, where the group was smaller, the afternoon discussion involved all participants together and there was no formal recording of actions, or a ranking of priorities.

At each of these meetings, a set of 10 posters outlining the steps and stages of this project were prominently displayed. After the workshop, the participants selected a recipient for a permanent location for these posters, which will remain in the communities.

The following section outlines the key themes, recommendations, and adaptation actions identified through the workshop process in each community, followed by a discussion of next steps for both research and action.

### **2.2.1 Prince Rupert Workshop Roundtable Report (December 5, 2011)**

The workshop in Prince Rupert was held at the North Coast Meeting and Convention Centre on December 5, 2011. Key themes that came up in the Prince Rupert workshop include:

1. The need to compile existing information and raise awareness at the local and regional scale – both as a specific action and also to support research, resource mapping, monitoring, and communication between stakeholders and communities.
2. Challenges associated with lack of provincial and federal government leadership / support for local initiatives.
3. High cost of research, monitoring tools, training.
4. Fisheries and oceans research that incorporates potential impact of higher traffic at the port.
5. Energy independence.

The top three actions or goals discussed during the workshop are detailed in the tables below. These actions provide a strong foundation for determining next steps in regional adaptation planning.

Along with these actions and recommendations, a number of other ideas were discussed. The need for flexibility to pursue the 'New Economy' was highlighted, along with the very real challenge of retaining young people and attracting skilled labour to the area. Linked to the concept of watershed based planning is the call for integrated resource planning within forest management. Throughout many of the recommendations, a common theme was the need for more data and assessments to be done, in order to facilitate tracking and monitoring of the impacts of both climate change and development. Research needs also include improving regional understanding of bogs, the species that depend on them, and the investigation of potential climate action opportunities that may result from more knowledge of this understudied issue.



Table 2.1

<b>Prince Rupert Goal 1: Raising Awareness of climate change impacts through a Watershed-based planning network for the Skeena region.</b>
<b>What enables this goal?</b>
<ul style="list-style-type: none"> <li>• Strength of existing local skill set and strong regional attitude of self-reliance.</li> <li>• Community groups are interested in collaboration.</li> <li>• Communication technology exists and can easily be developed to support the goal (regional listserv, websites, etc).</li> <li>• There is a growing amount of watershed data and research that can be used to support planning and collaboration.</li> <li>• Prince Rupert is at the gateway of a valuable transport and energy corridor.</li> </ul>
<b>What are the barriers or challenges?</b>
<ul style="list-style-type: none"> <li>• Property Rights is a key issue – Treaty settlement will change things.</li> <li>• Prince Rupert is downstream from a lot of watershed impacts that exist out of local control.</li> <li>• Awareness is a challenge; there is a need to make adaptation issues mainstream.</li> <li>• Land and Resource Management Plan is not the right approach.</li> <li>• Local collaboration happens but provincial and federal intervention is not positive.</li> <li>• Regional planning is difficult because there are no by-laws at this scale (health care is organized regionally but not water / fish).</li> <li>• Historically, watershed planning initiatives have had limited success.</li> </ul>
<b>What is required to achieve this goal? What are the next steps?</b>
<ul style="list-style-type: none"> <li>• Compilation of regional data and studies, made available through a common website.</li> <li>• Improved knowledge of local resources.</li> <li>• Watershed-scale perspective to analyze impacts of land-use and climate change.</li> <li>• Improved regional communication to set direction and share experiences and knowledge.</li> <li>• Clear objective setting is critical to raising awareness and collaboration.</li> <li>• Prince Rupert can't solve this alone, we need to share and collaborate.</li> <li>• Need to encourage participation.</li> </ul>

Table 2.2

<p><b>Prince Rupert Goal 2: Improve assessment and monitoring of fisheries through:</b></p> <p>1) Mapping of nutrient rich forage feeds for migratory fish in estuarial zone to understand how to better manage in the region.</p> <p>2) Moving forward with FSW designation process and implement monitoring protocol across the watershed.</p>
<p><b>What enables this goal?</b></p> <ul style="list-style-type: none"> <li>• Related regional research on salmon coastal migration could be connected.</li> <li>• Community will to achieve goals exists.</li> <li>• Can use interagency marine planning process to bring issues to the forefront.</li> <li>• There is capacity within the region; training during CCAP FSW monitoring pilot but also other experts, schools, organizations with capacity.</li> <li>• FSW protocol aims to be cost effective.</li> <li>• There are other bench mark studies that could be applied to this (1999 habitat mapping project).</li> <li>• Knowledge and support from First Nations.</li> </ul>
<p><b>What are the barriers or challenges?</b></p> <ul style="list-style-type: none"> <li>• There is no central government capacity; it will require local community participation and knowledge to do local assessments.</li> <li>• Major funding requirements for equipment, training, and ongoing monitoring.</li> <li>• Uncertain political will; locally, provincially and federally.</li> <li>• With the decline of the commercial fishery, there could be a loss of advocacy.</li> </ul>
<p><b>What is required to achieve this goal? What are the next steps?</b></p> <ul style="list-style-type: none"> <li>• Enforce industry funding of water and water-table monitoring for all land-users.</li> <li>• Need to clearly define scope and terms of research project.</li> <li>• Determine possible sources of funding and establish governance structure.</li> <li>• Community-to-community dialogues and networking</li> </ul>

Table 2.3

<p><b>Prince Rupert Goal 3: Achieve sustainable energy independence for Prince Rupert.</b></p>
<p><b>What enables this goal?</b></p> <ul style="list-style-type: none"> <li>• Port of Prince Rupert is ready to keep energy footprint low and buy alternative power.</li> <li>• Ability to draw on examples of successful projects like Dockside Green initiative in Victoria.</li> <li>• Abundant sources of renewable energy (wind, wave, wood)</li> <li>• Coast Tsimshian Resources interest and investment in feasibility study of bioenergy production.</li> <li>• BC Bio-energy networks and BC government are granting funds to support projects.</li> <li>• Regional interest of some First Nations communities in energy independence, development, and planning.</li> </ul>
<p><b>What are the barriers or challenges?</b></p> <ul style="list-style-type: none"> <li>• Challenges of negotiating with BC Hydro.</li> <li>• Cost of feasibility studies and implementation.</li> </ul>
<p><b>What is required to achieve this goal? What are the next steps?</b></p> <ul style="list-style-type: none"> <li>• Need regional negotiation with BC Hydro.</li> <li>• Continued community engagement with renewable energy experts and industry.</li> <li>• Double rail line or build a road around the city to the Port.</li> </ul>

### 2.2.2 Lax Kw 'alaams Workshop Roundtable Report (December 6, 2012)

The Lax Kw 'alaams workshop was held on December 6, at the Elders Centre in the community. In Lax Kw 'alaams, the structure of the workshops proceeded differently than in Terrace or Prince Rupert. The presentations were less formal in order to allow for more discussion. Also, because of the consensus building approach used in this workshop, the afternoon discussion happened together with the whole group. The discussion was based on issues specifically identified by the group that was present. Participants in this workshop expressed their appreciation for the efforts of the team to bring the information into the community. Currently there is ongoing discussion about how to support the Grandmothers and elders to tell the story of local climate change to the youth and future leaders of the community.

Key themes discussed in the workshop included:

1. Creating a high school accredited curriculum out of the work that was presented to the community that includes traditional knowledge and stories.
2. The need to take care of fish to sustain the fish-based culture of Lax Kw 'alaams.
3. Making CTR's forestry sustainable for fish and forests, and communicating better with the community.

**Table 2.4**

Lax Kw 'alaams Goal 1: Engage youth and future leaders around local issues like climate change and resources.
<p><b>What enables this goal?</b></p> <ul style="list-style-type: none"> <li>• Existing local knowledge about the region and observations about local resource issues.</li> <li>• The Grandmothers are good teachers who help share information and stories.</li> <li>• Findings from this and other studies can be developed for youth.</li> </ul>
<p><b>What are the barriers or challenges?</b></p> <ul style="list-style-type: none"> <li>• There were not many people at the Lax Kw 'alaams workshop from the community.</li> <li>• In this study, youth and future leaders were not involved.</li> <li>• Many other issues of concern in the community.</li> </ul>
<p><b>What is required to achieve this goal? What are the next steps?</b></p> <ul style="list-style-type: none"> <li>• Work with Grandmothers to develop a local climate story that can be used to educate youth at different levels.</li> <li>• Use this research study to develop a high school curriculum for climate change and resource information.</li> <li>• Make presentations and posters from CCAP study available to the schools and teachers.</li> </ul>

Table 2.5

Lax Kw'alaams Goal 2: Increase use of local knowledge and observations on resources and climate change.
<p><b>What enables this goal?</b></p> <ul style="list-style-type: none"> <li>• Close community relationship with the natural environment.</li> <li>• Long-term knowledge / perspective on use and availability of natural resources.</li> <li>• Examples of First Nations knowledge from other regions (The Haida First Nation noticed late spawners off the coast of the Queen Charlotte Islands and more research should be done to track these).</li> </ul>
<p><b>What are the barriers or challenges?</b></p> <ul style="list-style-type: none"> <li>• A number of issues related to resource use and climate change have already been identified and include: <ul style="list-style-type: none"> <li>○ Seaweed not growing where it used to be.</li> <li>○ Gardens are no longer productive, alders have grown where gardens used to be and fruit trees don't grow anymore.</li> <li>○ Oil spills in the region in the past have caused significant damage to ocean resources and future pipeline proposals threaten to do the same.</li> </ul> </li> </ul>
<p><b>What is required to achieve this goal? What are the next steps?</b></p> <ul style="list-style-type: none"> <li>• Increased inclusion of local knowledge in future research studies.</li> <li>• Documentation of observed shifts in environment and community.</li> <li>• Soil and agriculture study to figure out why gardens aren't productive and to re-establish local food production.</li> </ul>

Table 2.6

Lax Kw'alaams Goal 3: Improve understanding of what is happening to fish, and especially to salmon and herring populations.
<p><b>What enables this goal?</b></p> <ul style="list-style-type: none"> <li>• Local knowledge of population shifts.</li> <li>• Existing studies on fish and herring populations and irregularities in spawning and migration.</li> </ul>
<p><b>What are the barriers or challenges?</b></p> <ul style="list-style-type: none"> <li>• Insufficient consultation with First Nations around management of fisheries.</li> <li>• Lack of transparency from DFO.</li> <li>• Multiple potential impacts make it difficult to pinpoint exact causes (ie: Sewage in Lakelse, forestry, climate change, road crossings, ocean temperatures, etc)</li> </ul>
<p><b>What is required to achieve this goal? What are the next steps?</b></p> <ul style="list-style-type: none"> <li>• Extend current research on salmon runs and ocean temperatures to determine if there is a link to climate change.</li> <li>• Implement FSW monitoring protocol in the region.</li> </ul>

Table 2.7

<b>Lax Kw 'alaams Goal 4: Improve forestry practices to ensure sustainability and long-term benefits to the community.</b>	
<b>What enables this goal?</b>	
<ul style="list-style-type: none"> <li>• Community ownership of CTR.</li> <li>• Knowledge from past experience and other examples of the impacts of logging (ex: the impact of logging on salmon populations in Owikeno).</li> </ul>	
<b>What are the barriers or challenges?</b>	
<ul style="list-style-type: none"> <li>• Timber supply and forestry issues are not well understood.</li> <li>• Lack of community engagement.</li> <li>• Balancing the economics of forestry with the value and impact on fisheries.</li> <li>• Uncertainty within the community as to the sustainability of CTR's logging practices; some say they are no better than others in the past.</li> <li>• Raw log export is controversial.</li> </ul>	
<b>What is required to achieve the goal? What are the next steps?</b>	
<ul style="list-style-type: none"> <li>• Improve communication and education about CTR and logging practices for the community.</li> <li>• CTR could hire a community relations person to maintain open lines of communication about future endeavours and investments, and to directly answer questions.</li> <li>• Implement FSW monitoring protocol across the region.</li> <li>• Investigate options for diversifying economy and processing timber here to create more local jobs.</li> </ul>	

### 2.2.3. Terrace Workshop Roundtable Report (December 8, 2011)

The Terrace was held at NW Community College on December 8. This workshop included the highest number of participants, representing a wide range of sectors. As a result of this workshop, a group of participants decided to form a Climate Change Adaptation Network to address specific issues around climate, energy independence and mega-projects. A number of issues were highlighted that were beyond the immediate scope of the research study but that provided insight into potential future research and regional initiatives that the community could benefit from. The 3 top goals, along with enabling factors, challenges or barriers, and needs and next steps are included in the tables below.

Key themes within the recommendations include:

1. Need for specific research and information to build community awareness and inform regional planning (extreme events, long term changes, industry impacts).
2. Communication between industry and public, especially with respect to mega-projects and with forest managers.
3. Specific forest management and logging operations adaptations.
4. Community and regional planning that considers climate change, energy and new economy – building education and training programs to be ready for the future, and have skills to adapt.
5. Road construction – as related to community protection, forestry and fisheries.

Table 2.8

Terrace Goal 1: Create multi-community regional planning network that take into account climate change and provides direction in the face of mega-projects.
<b>What enables this goal?</b>
<ul style="list-style-type: none"> <li>• Determination within community to ‘get it right’ this time when planning for development and mega-projects.</li> <li>• Community interest and participation in planning (ex: Lakelse Watershed Society has coordinator on staff).</li> <li>• Ongoing efforts to improve regional information and data.</li> <li>• Examples of local level efforts from around the province that can inform efforts in the Skeena (Kimberley, Columbia Basin Trust, Babine Watershed)</li> </ul>
<b>What are the barriers or challenges?</b>
<ul style="list-style-type: none"> <li>• Lack of information about proposed projects and climate change.</li> <li>• When times are tough short-term economics often trump environmental protection and long-term planning.</li> <li>• Climate issues are not part of daily lives so people are not well informed about them.</li> <li>• Bombardment with apocalyptic scenarios discourages action.</li> <li>• Lack of dynamism and diversity of activities.</li> <li>• Current Official Community Plans (OCP) are outdated (Thornhill’s is from the 1980s).</li> <li>• Lack of past planning when areas built up means that we are dealing with situations that wouldn’t normally exist under today’s planning standards (e.g. Lakelse).</li> <li>• Decisions made in Ottawa and Victoria.</li> <li>• Lack of funding for local efforts and challenge of organization.</li> </ul>
<b>What is required to achieve this goal? What are the next steps?</b>
<ul style="list-style-type: none"> <li>• Local climate change adaptation advocacy network or advisory group</li> <li>• Updating of regional plans based on new information and diversified resource investments.</li> <li>• Funding, leadership and organization.</li> </ul>

Table 2.9

Terrace Goal 2: Prepare for the future by solidifying Terrace as a centre for education and skills training that will be in demand in the future economy.
<b>What enables this goal?</b>
<ul style="list-style-type: none"> <li>• Have college and university campuses here already.</li> <li>• Computerization of forest industry = opportunity for increase in IT jobs, as evidenced by Prince George experience.</li> </ul>
<b>What are the barriers or challenges?</b>
<ul style="list-style-type: none"> <li>• Currently empty seats in carpentry and other trades at the college.</li> <li>• Young people are not staying in the area.</li> <li>• Lack of dynamism and diversity of activities.</li> </ul>
<b>What is required to achieve the goal? What are the next steps?</b>
<ul style="list-style-type: none"> <li>• Need to make these jobs and trainings attractive so people will stay and work at home, or come here to live; not just work and leave the area.</li> <li>• Need skilled trades education for local community, especially First Nations (e.g. for future pipeline).</li> <li>• Planning and consideration of what jobs will be there after construction phase, during operations of new infrastructure, and provide ongoing education.</li> </ul>

Table 2.10

**Terrace Goal 3: Forest management that incorporates climate change, extreme events and other values AND improved communication between forest managers and the public.**

**What enables this goal?**

- Second growth timber puts region in good position for long term planning.
- Assisted species migration and new seed zone transfer guidelines will soon be established.
- Better data allows engineers to re-write plans and designs.
- Research from this project can help guide pilot projects and test sites.
- Potential to utilize deciduous species.
- Cumulative effects analysis tool developed through SRWCP can be refined for operational use and scenario planning.

**What are the barriers or challenges?**

- Lack of specific local information on the risk of extreme rain/wind events;
- Recommendations from the public are not often followed.
- Uncertainty associated with Treaty settlement makes planning difficult.
- Outdated land management plans and lack of comprehensive plan for second growth.
- Forest stewardship plans are hard to understand.
- There is no legislative requirement to share information.
- Regulatory system does not currently support integrated management.
- Economics of harvesting.
- Concerns about credibility of the science.
- Need to understand magnitude of the increase of extreme events (monitoring and measurement required).
- Communication between resource management and community is insufficient; need for public meetings.
- Local communication with government and business has declined.
- Impacts from other land-users are not accurately monitored or understood.

**What is required to achieve this goal? What are the next steps?**

- Operationalize cumulative effects analysis framework for scenario planning.
- Refine SRWCP framework for integrated resource management.
- Improve and monitor connectivity of landscapes.
- Continued government investment in research and monitoring to improve reliability of models.
- Need monitoring and measurement data to understand magnitude of the increase of extreme events.
- Continued data collection and monitoring, including FSW protocol.
- Negotiation and revision for legislation to facilitate regulatory framework that supports integrated management.
- Improved means of communication between forest resource managers and the public.
- Assessment to determine optimal tree species and rotation schedules.

## 2.3 Discussion of Workshop Outcomes

Throughout all of the workshops, a common theme, albeit expressed differently, was the need to raise awareness about climate and resource issues locally and to plan regionally. In Terrace, a number of participants representing local municipalities, business, organizations, and government agreed to meet in early January to lay the ground work for an adaptation network. Similar interest exists in Prince Rupert and there is strong potential for regional collaboration. In Lax Kw 'alaams, suggestions for raising awareness focused around youth engagement and the tradition of storytelling which could be employed in schools to disseminate traditional ecological knowledge, as well as new information about climate change impacts.

Across all communities the concern over the future of salmon was highlighted both in the sociological research and the workshop discussions. Salmon are culturally and economically important to the area and there are a lot of questions about what is happening to the salmon in the Skeena and other rivers, and there is great interest in protecting them. All three communities would like to see continued refinement of monitoring processes and the implementation of the FSW monitoring programs across the watershed.

There are a number of challenges associated with the implementation of FSW monitoring for adaptive management, as pointed out by different groups. The question of who is responsible for monitoring was raised, along with the need for training and ongoing funding for a regional program. A monitoring program could be explored in partnership with local education institutions, resource managers, and environmental organizations. Given that a number of people have already been trained in the protocol, good opportunities exist for extension and participation.

Forestry is identified as both an avenue for growth and development, and a point of concern over the sectors' impact on other watershed values. Right now, actions to protect other resources come at an economic cost to forestry companies meaning that there is limited incentive or capacity to engage in integrated resource management beyond what is legislated. Tools like the cumulative effects analysis framework developed for the SRWCP are useful for helping foresters make decisions that minimize impact to fisheries; however, using these tools comes at a cost, especially if there are no policies in place that ensure the licensees are subject to the same rules, and that those who go beyond the legislative requirements for the benefit of the ecosystem will have their costs covered. Policy changes need to be made that help forestry companies operate more effectively, and profitably, to achieve optimal management of all resources.

In addition to managing forestry for a range of values, the need to explore options for the use of other types of wood and biomass was also expressed. Red Alder was pointed out for its potential in Asian markets. Participants were divided over the issue of raw-log export, recognizing that the current market situation and the quality of timber means that this is a viable option now, but hoping in the future to see diversification of forest products and local processing of timber. As second growth timber matures, there is optimism for options to revitalize local processing of timber. That said, some



participants expressed concern over the rate at which second growth is being harvested and the long-term sustainability of the resource. There is an imminent need for long term planning to manage second growth for economic and ecological reasons.

The region is primed for a number of other mega-projects, including mining, gas, and oil pipelines, and alternative energy projects. There remains a lack of clarity over how and when these projects may progress, and what the cumulative impact of these proposed resource developments could be. Unfortunately, there is not a mechanism for integrated management or planning of the region to assess impacts of development, let alone to incorporate climate change. People in all communities have expressed a desire to be included in development planning processes and to have open communication between all stakeholders.