AUGUST 9, 2004 - B.C. TAP WATER ALLIANCE
PRESS RELEASE BACKGROUNDER
REGARDING
THE LILLOOET LRMP
COMMUNITY/DOMESTIC WATERSHEDS

TEXT COMPARISONS OF:

- **1. CONSERVATION SECTOR INPUT (LATE 2000) [Pages 1-16]**
- **2. APRIL 23, 2001 PHASE ONE LILLOOET LRMP WATER TEXT [Pages 17-20]**
- **3. MARCH 11, 2002 LIBERAL GOVERNMENT SECOND RE-WRITING DRAFT OF THE LILLOOET LRMP WATER TEXT [Pages 20-25]**
- **4. THE JULY 2004 DRAFT LILLOOET LIBERAL PLAN WATER TEXT [P. 25-27]**

TEXT SECTION 1. CONSERVATION SECTOR INPUT: REVIEW OF THE OCTOBER 25, 2000 DRAFT WATER TEXT, SECTION 4.19, FOR THE LILLOOET LRMP

[NOTE: The Conservation Interest comments and changes throughout the following document are presented in 12-point font, and the draft Lillooet DUC (Draft Under Consideration), for comparison, is presented in 10-point font.**]**

1.(a). GENERAL OBSERVATIONS AND RATIONALE FOR CONSERVATION'S REVIEW OF THE WATER TEXT

* The material presented in the Water text, section 4.19, from pages 4.19-1 to 4.19-14 is disorganized, incomplete, confusing, and at times illogical. There is also some confusion created due to an overlap of issues in this section.

* Water is fundamental to all of the sections in the draft Lillooet LRMP DUC, and is therefore the cornerstone chapter in the General Management section (section 4). We restructured the information presented in the Water text in order to assemble it in a more clearly defined manner, and to help bring clarity and direction to each of the stated issues, goals, and objectives.

* The first section of the Water text was not titled or identified, in contrast to sections B and C. In reviewing the issues in this section, we divided the first section in two, as issues 1 through 5 focus on water licencing. The two sections are now as follows: section A, "Water Resources and Management Planning"; and section B, "Water Licensing and Resource Management". Domestic and Community Watersheds are now sections C and D.

* We believe that there may be grounds to isolate sections dealing with Domestic and Community Watersheds from the Water text, and that they have their own separate section in

the General Management section. Those grounds are related to the special management considerations that drinking water sources should have.

* We believe that the first issue, which we have introduced below, may be the key issue related to all of the other issues which follow, and should be understood as such.

* Our concern is that the vision statement is too general and emphasizes management, especially as it relates to consumptive use watersheds. In this sense, many concepts in the draft Water text, such as 'protection', need to carefully defined and understood.

1.(b). DESCRIPTION OF THE RESOURCE (pages 4.19-1, 2)

CONSERVATION INTEREST PROPOSED CHANGES:

> **VISION:** *"Water is the most critical resource and deserves the greatest care and attention during resource management planning and activities. Moreover, where a watershed in which human consumption of water is identified, the greatest consideration should be given to protect both surface-fed and groundwater sources."*

DUC
VISION: Water is recognized as a critical resource which is managed for both use and protection, ensuring that existing quality and quantity are maintained, and improved where possible.

CONSERVATION INTEREST PROPOSED CHANGES to the Description of the Resource (first two paragraphs):

> "Water, in the form of surface and groundwater, is the foundation for fully-functioning and healthy ecosystems, which provide habitat and food for fish and wildlife. Intact soils filter and regulate the flow of water to watershed systems. Water is also a critical resource for human uses.
>
> In terms of water quality and quantity, most of the water regimes in the Lillooet Plan Area have been influenced by various resource activities, the most significant being access roads, forest management activities, and large storage dams on the Bridge and Seton River systems. Other significant influences on water regimes are related to the agriculture industry, through irrigation licencing, cattle ranching, and applications of herbicides and pesticides. One of the most critical needs for communities is availability of and high quality water, both for Domestic and Community Watersheds."

DUC
4.19 WATER
DESCRIPTION OF THE RESOURCE
Note to readers: Revisions from the last Fish/Water Working Group meeting are incorporated in this version, but the Working Group has not reviewed these revisions.
Water is an essential resource that is available as surface or groundwater. As water is a finite resource, water availability and water quality have the potential to impact regional growth and economic development. BC Hydro is the largest licensed user of water resources in the plan area, as it regulates water on the Bridge River and Seton River systems by a series of dams. Second to BC Hydro, the agriculture industry is the largest user of water. Growth of the agriculture industry (on both private and Crown lands) will be dependent on the availability of water into the future.

Water is a crucial component of the Plan Area's ecosystems, as the lakes and rivers and riparian areas associated with these water bodies provide habitat and food for fish and many wildlife species. The key consideration for this LRMP is protection of water quantity and quality. As communities continue to grow and prosper within the Lillooet LRMP area, the demand on domestic water supplies will also continue to grow. It is important to consider future water needs during resource development in order to ensure that an adequate volume of clean water continues to be available to all residents.

There is considerable variation in precipitation from west to east. In the upper watershed near the Coast Mountains there are thick forests and large icefields and annual precipitation may be around 2000 mm. Lillooet, in the eastern end of the Plan Area, lies within the dry Interior and has annual precipitation of 300 to 400 mm. Due to the semi-arid climate, much of the Plan Area is dependent on the runoff from winter snowpack at higher elevations.

The Plan Area contains two major river systems - the Bridge River and Seton River, which flow into the Fraser River on the eastern flank of the Plan Area. As well, the Thompson River flows through Spences Bridge and into the Fraser River at Lytton. Other significant watercourses are Cayoosh Creek and Portage River (Seton river system); Yalakom River, Tyaughton Creek, Williams Creek and Fergussen Creek (Bridge river system), and the Stein River.

Historical volcanic activity has deposited a layer of material that is deep in a localized area around Gun Lake, and lighter at Gold Bridge, Bralorne and Tyax. This material, known as Bridge River Ash, resembles pumice and is highly porous with rapid drainage. The implications of this material on water management, including during road construction and maintenance, were considered during this process. Based on the advice of specialists (Kevin Turner and Graeme Hope, Ministry of Forests, Kamloops), it was decided that specific management objectives and strategies were not needed in this plan. However, residents of the Gun Lake area are unsure that the characteristics and management implications of this material are now fully understood.

CONSERVATION INTEREST PROPOSED CHANGES, to the sections on Storage Dams and Community Watersheds (pages 4.19-1,2):

Major Dams and Irrigation (page 4.19-2)

> The Bridge River system incorporates two large reservoirs for hydro-electric power generation, owned and operated by B.C. Hydro. As such, B.C. Hydro is concerned about water availability and storage capacity. The principal source of water availability for B.C. Hydro's reservoirs, and for irrigation users, stems from forested landscapes. Forest hydrology, the science which, in part, examines the results of forest management on water flows and water quality, suggests that these reservoirs may be experiencing some repercussions from this resource use, activities which may both reduce water availability during Summer and Fall, and increase sedimentation rates. Studies should be conducted to evaluate these effects.

Community Watersheds (page 4.19-2)

> There are currently 21 [not 19 - see table below] Community Watersheds within the Plan Area, presently designated as both *Land Act* Watershed Reserves and those designated under the Forest Practices Code of B.C. Act. In addition, there are nine (or more) watersheds within the Plan Area that communities are seeking status as Community Watersheds. Because management activities, principally related to forestry and agriculture, affect water quality and quantity, it is important that the Ministry of Environment, Lands, and Parks conduct formal assessments on both developed and undeveloped Domestic and Community Watersheds.

DUC

Storage Dams

Minor Dams

There are six minor dams (less than 10 metres high) in the Plan Area. These structures are mostly located on the East Side of the Fraser River (with the exception of the Moore Lake reservoir on the west side) and are used to store water for irrigation. Future development will need to consider storage of water as an option that will be dependent on the availability of suitable storage sites. Further studies, especially for agriculture, need to be completed to assess the potential for storing water.

Major Dams

BC Hydro operates three hydroelectric generating facilities within the Plan Area, supplying power to the provincial transmission grid. There are two dams on the Bridge River, Lajoie Dam and Terzaghi Dam and one on the Seton River. The primary operating objectives of this system are for hydro-electric power generation, flood control and the maintenance of minimum flow. Downstream water supply, fisheries, wildlife habitat, and recreational activities are considered in the operation of these facilities.

Water Quality

Key water quality concerns for most parts of BC relate to deterioration by sedimentation, nutrient loading, contamination, and waterborne diseases. Some water quality monitoring data are available for the Bridge River, Yalakom River, Carpenter Lake, Cadwallader Creek, lower Lajoie Creek, Gun, Pavilion and Lajoie Lakes. Results indicate that high metal levels may be present in some areas (Carpenter Lake, Gun Creek), that water quality is very variable throughout the Plan Area and that more up-to-date and detailed sampling is necessary to determine management plans. Water quality in mainstream lakes throughout the Plan Area is generally good.

Groundwater

Groundwater is often chosen as a water supply where surface water is not readily available. There is currently inadequate groundwater management and protection in the Plan area, due to lack of legislation, limited resources, and information.

Water Management has classified aquifers in the Plan area. These aquifers are located at Lillooet (one east and one west of the Fraser), D'Arcy and Seton Portage, and are classified according to their level of use and vulnerability to contamination. All the aquifers are located in valley bottoms and partly up valley sides where land is primarily under private ownership. However, upland drainage areas, which provide recharge to these aquifers, are predominantly Crown lands and also need adequate protection. As local and regional governments have control over valley bottom land use, they need this aquifer information to plan growth and land use to minimize adverse impacts on groundwater.

Community Watersheds

There are nineteen community watersheds within the Plan Area presently designated under the Forest Practices Code of British Columbia Act. In addition, several other communities within the plan area are considering seeking status as a Community Watershed (*this has not been confirmed)*, with the Gun Lake Rate Payers having applied for status. Water monitoring is occurring in Murray and Nekliptum Creeks. The setting of water quality objectives by MELP is also required. Water quality objectives for forestry related activities are not available for any of the area's community watersheds.

1.(c). WATER ISSUES, GOALS, AND OBJECTIVES

A. WATER RESOURCES AND MANAGEMENT PLANNING

CONSERVATION INTEREST: COMMENTS FOR SECTION A

* We have moved issue 6 to the forefront of this section, as it is the most important issue regarding the Plan Area and water resources (the way that issue 6 was presented, was that it was not framed as an issue, but as a goal).

* Incorporation of a new issue for section A, Issue A-2 below. There is no assessment of roads as they affect water quality and quantity in the draft Water text. Throughout forest research literature, roads are identified as having one of the greatest influences on the alteration and redirection of water flows, influences which sometimes lead to landslide events. For instance:

"Roads are one of the most significant causes of increased erosion. Road construction exposes large areas of mineral soil to removal by rainwater and snowmelt. Sediment is easily delivered to water courses during wet periods because roads and their drainage ditches frequently intercept stream channels.... The erosion and transport of sediment from roads is exacerbated by the greatly reduced infiltration capacity of mineral soils on cut banks, running surfaces, and fill slopes, caused by compaction and the loss of organic horizons. Roads and skid trails also intercept and concentrate surface runoff so that is has more energy to erode even stable soils..... Roads can also cause rapid mass movements and result in very large increases in sediment loads." (*Interior Watershed Assessment Procedure Guidebook, Level 1 Analysis*, Forest Practices Code of B.C., September 1995, Appendix 9, pages 70-71.)

***** Under the Objective for water quantity monitoring information for issue A-1, we recommend that more monitoring stations be established. We believe it is important that at least one station be established in an undeveloped smaller-scale watershed, after discussion of candidate watersheds by government staff, with input from interested parties. Development activities alter water timing and flows, and it is critical that reliable information be retrieved from an undeveloped watershed over many years. Funding and research for additional monitoring could be achieved through university interest.
It was also mentioned in the Issue statement that there is "little or no data available about ground water flows". Perhaps some monitoring stations could be incorporated to monitor ground water flows.

***** There is no mention in the document of previous watershed assessments conducted in the Lillooet Plan Area, which should be provided in a table, with appropriate categories. We understand that Murray and Twaall watersheds have both had Forest Practices Code watershed assessments, and Murray is the only one that has had public involvement. The Downton watershed has been assessed, but it was not a Forest Practices Code assessment. Nicoaman has had a Forest Practices Code watershed assessment. The Hurley drainage has had a watershed restoration assessment. The Intlpam watershed has had an assessment by Ainsworth in the summer of 1999, however it was not provided to First Nations for their review.

***** In terms of having a hydrologist conduct a watershed assessment in Issue A-1, we believe it is critical that an independent hydrologist be contracted, rather than a hydrologist who may be under contract by the forest licencee. This approach will help to provide a more objective analysis of a defined watershed system.

CONSERVATION INTEREST PROPOSED CHANGES:

ISSUE A-1: *Watersheds are the natural functional units of a landscape. Water, in its form as both surface runoff and groundwater, is critical to watershed ecosystem function, and is one of the most significant issues affected by resource use in the Plan Area watersheds, uses which impact on water flow, water quality, and water quantity.*

DUC**:**
6) Issue. *The impacts of development on water quality and quantity needs to be considered during planning the development of some watersheds within the plan area.*

CONSERVATION INTEREST PROPOSED CHANGES:

The cumulative effects of human and industrial disturbances within watersheds may alter the timing and magnitude of peak flows. As such, roads have been identified as having the greatest effect on intercepting and altering water flows. These disturbances may lead to a number of impacts, such as erosion, introduction of sediment to streams, channel destabilization, mass wasting and movement, loss of aquatic habitat, low flows and water quality deterioration. These potential impacts are particularly important in the Lillooet Plan Area because of the extensive lake/stream systems in the area, the steep slopes, variable climate and provincially/regionally significant fish values.

DUC
The cumulative effect of disturbance, both industrial and natural, in a number of sub-basins within a watershed (or watersheds within a basin) may alter the timing and magnitude of peak flows which may lead to a number of impacts such as erosion, introduction of sediment to streams, channel destabilization, mass wasting and movement, loss of aquatic habitat, low flows and water quality deterioration. These potential impacts are particularly important in the Lillooet Plan Area because of the extensive lake/stream systems in the area, the steep slopes, variable climate and provincially/regionally significant fish values.
There is a need to improve the process for prioritizing watersheds requiring assessments, and to implement assessment procedures that are appropriate to the plan area.

CONSERVATION INTEREST PROPOSED CHANGES:

Goal A-1: *To protect, maintain, and restore the water resource functions in the Plan Area.*

Objective A-1(a): *Identify the risks to water from resource use, and then implement proper management activities which will help to maintain the stated goal.*

Objective A-1(b): *Obtain better information about surface and groundwater flows and water quality for land and resource management decisions.*

Objective A-1(c): *Improve water management by prioritizing watersheds requiring assessments, and determine which of the prioritized watersheds have had assessments completed.*

Objective A-1(d): Maximize the usefulness and cost effectiveness of IWAPs completed within the plan area by the Watershed Assessment Committee defining the issues to be addressed and the scope of assessment, and selecting the hydrologist who completes the assessment.

Objective A-1(e): Minimize the cumulative watershed impacts resulting from development, and enhance hydrological stability and recovery.

DUC
6.1) Goal: To develop and implement watershed management approaches which address water quality, quantity and timing of flow at the watershed level.
6.1.1) Objective: Improve water management by prioritize watersheds requiring assessments using the Lillooet District-wide Watershed Screening Framework.
Indicator(s): Prioritized list of watersheds for detailed assessment; which of the prioritized watershed have had assessments completed
Responsibility for implementation: MELP-Environment, Water Branch/MOF
Responsibility for monitoring: MOF
Note to Readers:
The following objective is not agreed to by the Working Group. Alternatives for consideration are:

Alternative 1 – Not an issue. The FPC Watershed Assessment Guidebook provides adequate direction.
Alternative 2 – Provided below
Alternative 3 – Local committee composed of all relevant stakeholders with responsibility for all activities potentially impacting water supplies. Decisions by majority of 60 % or 65 %. Selection of the hydrologist must be made by the committee, funded by the developer, with the individual clearly legally responsible to any water management group, or individual water licence holders affected by his opinion.

6.1.2) Objective: Maximize the usefulness and cost effectiveness of IWAPs completed within the plan area by the Watershed Assessment Committee defining the issues to be addressed and the scope of assessment, and selecting the hydrologist who completes the assessment.
Indicator: Usefulness and cost-effectiveness of IWAPs
Responsibility for implementation: Development proponent
Responsibility for monitoring: MOF

6.1.3) Objective: Minimize the cumulative watershed impacts resulting from development, and enhance hydrological stability and recovery.
Indicator: Hydrological stability and recovery in prioritized watersheds
Responsibility for implementation: Agencies reviewing development proposals
Responsibility for monitoring: MELP-Environment, Water Branch

CONSERVATION INTEREST PROPOSALS:

ISSUE A-2: *Roads are generally recognized as having one of the greatest impacts on the alteration of water flows and on increased sedimentation rates to stream systems.*

Goal A-2: *To assess the impacts of roads to stream environments in the Plan Area, to determine candidates for formal road deactivation, and to implement strategies to minimize future road construction proposals.*

Objective(s) to be formulated by working group/government staff.

CONSERVATION INTEREST (No changes):

ISSUE A-3: *Water quality is at risk of contamination within the plan area.*

Goal A-3: *Maintain water quality throughout the plan area.*

Objective A-3: *Provide water that is both safe to drink and suitable for fish habitat throughout the plan area.*

DUC
7) Issue: *Water quality is at risk of contamination within the plan area.*
Within the plan area, both surface and ground water quality can be negatively impacted by agricultural or forestry practices, residential development, or recreational activities. Water quality can be affected by discharge of wastes, alteration of riparian conditions or introduction of sediment to streams. Avoiding contamination of the water flow to the mapped aquifers in the plan area is important.
7.1) Goal: Water that is safe to drink and is suitable for fish habitat throughout the plan area.
7.1.1) Objective: Maintain water quality throughout the plan area.
Indicator: Situations where unsafe or undrinkable water conditions occur, and where water quality is unsuitable for fish
Responsibility for implementation: Agencies reviewing development proposals
Responsibility for monitoring: MELP-Environment, Water Branch

1.(d). SECTION 4.19 - B. WATER LICENCING AND RESOURCE MANAGEMENT [Note: the following section is based on the reorganization of Issues 1 through 5 of the November draft Water text, pages 4.19-3 through 4.19-11.]

Conservation Interest: General Comments for section B

* It appears that the concerns raised in issues 1, 2, 3, 4, and 5 are common to agricultural, industrial, and consumptive use water licencing, and as such we recommend that they constitute their own section, section B.

* We have rearranged the order of the issues, with issue 4 taking precedence, beginning with B-1.

* Remove issue 5, regarding the "enhancement" of water flows in dry sites, from the Water text. This controversial issue should not be considered at this time, until good data and clarity is properly provided by forest research scientists and a technical committee. Logging may "enhance" water flows for one specific season, but those flows may be "diminished" for another/other season(s).

* We have made minor changes to the wording of the issues, goals, and objectives in the text, and some changes to the points under discussion.

* Issue 2 is redundant with issues 3 and 4. However, groundwater, which is mentioned in issue 2, should remain the focus of monitoring considerations.

* The draft DUC Water text is presented in 11 point font for comparison to our recommended changes presented in 12 point font.

* We also recommend that the overlaps of these issues pertaining to Domestic and Community Watersheds should be identified generally in this section, but also treated separately in the Domestic and Community Watersheds sections.

CONSERVATION INTEREST PROPOSED CHANGES:

ISSUE B-1: *Water licensing allocations for industrial, agricultural, and consumptive uses are inconsistently applied or not adequately accounted for when considering the water needs for fish habitat and aquatic ecosystems. There is a need to provide a comprehensive inventory of fresh water requirements for fish habitat and aquatic ecosystems in the Plan Area.*

Draft DUC
(4) Issue: *Concerns that current water licensing decisions, and water use practices do not adequately account for the water needs for fish habitat and aquatic ecosystems*.

Provincially and regionally significant fish values exist within the plan area, including in the drier portions where low water flows may reduce the quality of the fish habitat and aquatic ecosystems.

The first step to ensuring water needs for fish are met is to define the water flow needs for fisheries within specific stream systems. Currently there is not an agreed upon procedure to define these water needs in the plan area.

Also, when new or amended water licenses are evaluated, there is currently no legal requirement to consider water needs for fish or aquatic ecosystems. This is because fisheries and aquatic ecosystem values are not considered a "beneficial use" under the Water Act. While the new Fish Protection Act creates a mechanism to designate streams where fish water needs must be considered (or met??), it is uncertain whether streams in the plan area will be designated.

(*Note to WG: Next 2 paras are not text, and not edited yet)*
The Province owns the water and most of the land in British Columbia and can therefore indirectly legislate with respect to fish and fish habitat. In addition, BC has constitutional authority to legislate with respect to local works and undertakings, property and civil rights and matters of a local nature. The Province also relies on agreements with the federal government to secure a direct role in the management of fisheries.

The federal and provincial governments both contribute to fish protection by legislating in areas that are within their control. The federal Department of Fisheries and Oceans (which administers the Fisheries Act, Canada), the Ministry of Environment, Lands and Parks (which administers the Water Act and the Fish Protection Act) and the BC Ministry of Fisheries have adopted a cooperative approach to the development of regulations under the Fish Protection Act. Both levels of government are committed to work together to ensure that fish and fish habitat are adequately protected for future generations.

Water flow requirements for bull trout are particularly important in the plan area because this blue-listed species has a narrow water temperature tolerance, which makes it vulnerable to high stream temperatures that can result from periods of low flow. This species is particularly susceptible because it is suspected to often inhabit the top ends of stream systems where low flows and high temperatures are not offset by other water sources.

CONSERVATION INTEREST PROPOSED CHANGES:

Goal B-1.1: *To carefully assess sufficient water flow and temperature needs of fish and aquatic ecosystems for consideration in water licensing decisions.*

Objective B-1.1: *Define methodologies to specify the water flow needs for fish and aquatic ecosystems for watersheds within the Plan Area.*

Draft DUC
[4.1) Goal: *To define water flow needs for fish and aquatic ecosystems for consideration in water licensing decisions.*
4.1.1) Objective: *Define methodologies to specify the water flow needs for fish and aquatic ecosystems for watersheds within the plan area.*

Indicator: Existence of feasible methodologies
Responsibility for implementation: MELP-Environment, Water and Fisheries Branches
Responsibility for monitoring: MELP-Environment, Fisheries and Water Branches]

Note to reader: A 'General Stream Regulation' is being developed by government which may fully address the objectives developed in this section. If the Regulation is available before the completion of this Plan, this section will be adjusted appropriately.

CONSERVATION INTEREST PROPOSED CHANGES:

Goal B-1.2: *To meet the needs of fish and aquatic ecosystems and address the requirements of present and future water license holders.*

Objective B-1.2: *To fully meet and consider the needs of fish and aquatic ecosystems and then provide for licensed water use.*

DUC
4.2) Goal: To meet the needs of present and future water license holders while addressing the water needs of fish and aquatic ecosystem.
4.2.1) Objective: Provide for licensed water use while fully understanding and considering the needs of fish and aquatic ecosystems.
Indicator(s): Number of stream systems with water licenses where fish or aquatic ecosystems are considered to be at risk
Responsibility for implementation: MELP-Environment, Water Branch
Responsibility for monitoring: MELP-Environment, Water Branch

Goal B-1.3: *Water license holders must help to prevent fish winterkill, summerkill and loss of fish habitat on waterbodies (including storage/irrigation reservoirs).*

Objective B-1.3: *Encourage and enforce existing and new water license holders to implement conservation strategies which reduce the amount of water required for irrigation, commercial and domestic use. Where it has been proven that the water needs for fish habitat or aquatic ecosystems have not been met, promote the reallocation of water that is conserved to 'conservation use', principally to maintain adequate flows for fish and aquatic ecosystems where this need exists.*

DUC
4.3) Goal: Where it's agreeable to the water license holder, encourage water management practices that prevent fish winterkill, summerkill and loss of fish habitat on waterbodies (including storage/irrigation reservoirs).
4.3.1) Objective: Encourage existing and new water license holders to implement conservation strategies which reduce the amount of water required for irrigation, commercial and domestic use. Where it has been proven that the water needs for fish habitat or aquatic ecosystems have not been met, promote the reallocation of water that is conserved to 'conservation use', principally to maintain adequate flows for fish and aquatic ecosystems where this need exists.
Indicator(s): Conservation strategies implemented by water users.
Responsibility for implementation: Water licensees, Ministry of Agriculture, MELP-Environment, Water Branch.
Responsibility for monitoring: MELP-Environment, Water Branch.

CONSERVATION INTEREST PROPOSED CHANGES:

ISSUE B-2: *There is a shortage of comprehensive water allocation inventories for industrial, agricultural, and consumptive uses in the Plan Area watersheds.*

Goal B-2. *To determine which watersheds within the Plan Area need to be properly inventoried for past, present, and future water licencing, in order to improve on the process for water licence permitting for industrial, agricultural, and consumptive uses.*

Objective B-2: *Identify water storage opportunities for domestic, agricultural and industrial development while meeting, considering and incorporating the water needs for fish and aquatic ecosystems.*

DUC
3) Issue: *Lack of Inventories of water available for storage and use.*
Settlement and resource development, including agriculture, are dependent on the allocation of water through water licenses. Although water is a key resource in the plan area, there is not currently an inventory of water available, either through surface or storage opportunities, for agricultural, domestic or industrial use. The absence of an inventory of available water delays and complicates development of these industries.
3.1) Goal: *To meet water needs for domestic, agricultural and industrial development*
3.1.1) Objective: *Identify water storage opportunities for domestic, agricultural and industrial development while recognizing, considering and incorporating the water needs for fish and aquatic ecosystems.*

Indicator(s): Status of an inventory of water opportunities for development and prioritized watersheds for water allocation planning.
Responsibility for implementation: Ministry of Agriculture
Responsibility for monitoring: Ministry of Agriculture

CONSERVATION INTEREST PROPOSED CHANGES:

ISSUE B-3: *The network of government operated water gauging stations on large systems in the Plan Area has been reduced substantially in the past few years, which has led to a reduction in water quantity (flow) information. There are no water monitoring stations in smaller watershed systems, particularly in undeveloped watersheds*.

DUC
1) Issue: *Lack of water quantity (flow) monitoring information.*
Water is in short supply in portions of the plan area, and is required for domestic, agricultural, and industrial use as well as for aquatic ecosystem function, especially given the provincially an regionally significant fisheries values in the area. Better information about surface and ground water flows and water quality is needed for land and resource management decisions. (*Note: List of existing water gauging stations (Seton – 2, 1 Yalakom – 1, Hurley River – 1, Pavilion (??) – 1, Thompson R. – 1, Fraser R. – 1, Bridge River – 1) be added to the description, with a note that many stations have been abandoned in recent year)*
Water gauges collect information about the water inputs and flows in a water system. The network of government operated water gauging stations in the plan area has been reduced substantially in the past few years. In addition, water flow information is collected by a variety of organizations, and is sometimes difficult to access. Currently there is little or no data available about ground water flows.
The data collected from a monitoring station for a particular watershed must to be analysed to understand the water 'discharge' – how much and when water flows through the system. This information is then used to evaluate the impacts of water licenses, fish and aquatic ecosystem needs, and other resource activities.
(*Note to editor for next versionÉflag in water quality section as well)*

CONSERVATION INTEREST PROPOSED CHANGES:

Goal B-3: *To preserve and enhance the existing water flow monitoring network within the plan area, and provide additional water flow monitoring equipment in smaller watershed systems, particularly in one or more undeveloped watersheds.*

Objective B-3: *Determine if the existing hydrometric network needs to be enhanced, and identify watershed candidates for the expansion of hydrometric information. Better information about surface and groundwater flows and water quality is needed for land and resource management decisions.*

DUC
1.1) Goal: *To preserve and enhance the existing water flow monitoring network within the plan area.*
1.1.1) Objective: *Maintain the existing hydrometric network, and enhance the network where possible, within the plan area.*
Indicator(s): Status of existing stations; availability of monitoring information to *whom??*
Responsibility for implementation: Water Survey of Canada for the existing network
Responsibility for monitoring: MELP-Environment, Water Branch
1.2) Goal: To maximize sharing of water flow data for the plan area.
1.2.1) Objective: Maximize sharing of water flow data broadly, including as the general public and stakeholder organizations.
Indicator(s): Unresolved concerns about access to information.
Responsibility for implementation: Organizations having water flow data
Responsibility for monitoring: MELP-Environment, Water Branch

1.3) Goal: To provide analysis of water discharge information for watersheds where this information is key to resource management decisions
1.3.1) Objective: Provide analysis of water flow data to provide discharge information, which includes how much water flows when, for identified streams.
Indicator(s): Availability of accurate water discharge analysis for identified key streams
Responsibility for implementation: BC Hydro, MELP- Environment, Water Branch
Responsibility for monitoring: MELP-Environment, Water Branch

CONSERVATION INTEREST PROPOSED CHANGES:

ISSUE B-4: *Though groundwater flows are an important contributor to overall lake, in-stream flows, and to aquifers, they are not well understood, and should be considered in water allocation planning and decisions. In addition, groundwater use (i.e. drilling wells) is not legally regulated, making it impossible to include in allocation planning and decisions.*

Goal B-4: *In the absence of information on groundwater flows, it is important to provide interim strategies to deal with groundwater dynamics in management planning and water licencing.*

Objective B-4: (Same as objective 2.2.1) *Improve water allocation planning and decisions by including consideration of ground water use and contribution to stream flows.*

DUC
2) Issue: *The need to do further water allocation planning.*
Water is a key resource in the plan area for agriculture, domestic and industrial use, as well as for fish habitat and aquatic ecosystems, particularly in the drier eastern areas.
Water allocation planning, which includes analysis of seasonal water flows, licensed use and ecological needs, is not currently actively undertaken by any of the resource agencies. This has led to concerns as to whether appropriate water licensing decisions are being reached. There are also concerns about whether fish habitat and aquatic ecosystems are currently being damaged by low water flows, especially during key periods.
In addition, Currently groundwater flows are not well understood, however, these water sources should be considered in water allocation planning and decisions. In addition groundwater use (i.e. drilling wells) is not legally regulated, making it impossible to include in allocation planning and decisions.
John L. suggests adding that all water use is not licensedÉand should be
2.1) Goal: To ensure the best available information is considered during new water licensing decisions and licensing amendments.
2.1.1) Objective: In watersheds where there are water shortages, water allocation planning should be conducted and this information should be considered in water licensing decisions.
Indicator(s): Extent of water allocation planning within watersheds where there are water shortages
Responsibility for implementation: MELP-Environment, Water Branch
Responsibility for monitoring: MELP-Environment, Water Branch
2.2) Goal: Groundwater flows and use are included in water allocation planning and decisions
2.2.1) Objective: Improve water allocation planning and decisions by including consideration of ground water use and contribution to stream flows.
Indicator: Number of water allocation plans and decisions that include consideration of groundwater flows and use
Responsibility for implementation: MELP-Environment, Water Branch
Responsibility for monitoring: MELP-Environment, Water Branch

1.(e). SECTIONS C AND D: DOMESTIC AND COMMUNITY WATERSHEDS

CONSERVATION INTEREST COMMENTS

Community surface-fed drinking water Watersheds, and groundwater sources, should be identified as having key priority in the Lillooet Plan Area, and in all provincial Forest Districts. According to the draft Water document (4.19), the LRMP Working Group has failed to reach agreement on

management practices for both section B, *Licenced Domestic Water Use*, and section C, *Community Watersheds*. This is not surprising, given the attention and importance that drinking water has recently received, and the standard conflicts between water users, who rely on water quality, and commercial resource users. **Because of this shortfall, the Working Group has, to a great extent, decided to adopt/consider the final draft *Water* text by the Okanagan/Shuswap LRMP process.** The Okanagan/Shuswap *Water* document, however, is not without a series of controversial problems regarding management options for both Domestic and Community watersheds, and the entire document should be carefully scrutinized before being simply adopted. Relatedly, the Lillooet LRMP Draft DUC should have a backgrounder on provincial policy and recent public review processes on this topic.

The assumption in the Okanagan/Shuswap document is that resource use associated with road access, forestry, cattle ranching, and mining are a fundamental management component to community watersheds. Key concerns in the Okanagan/Shuswap report relate to: (a) Roads/access; (b) Logging; (c) Agriculture/domestic cattle; (d) Mining; (e) Application of herbicides/pesticides; (f) fuel/oil spills; (g) commercial/recreational activities. How is water seen as the primary use, when these, and sometimes combined, activities threaten that use? Who is responsible/liable when these resource activities affect water quality to water users? If some of these activities result in serious health problems, who is responsible? Do contractors post bonds to cover all contingent long-term damages and expenses?

Because of the special role that must be assigned for the administration of Community Watersheds, and the matter of the transfer of the Okanagan/Shuswap Water text to the Lillooet LRMP DUC that we are critical of, we are deferring direct comments and criticisms for sections B and C of the Water text. Rather, we would like to present a summary of our concerns in the **Recommendations Regarding Community Watersheds** below, and attendant concerns.

There is also no provision in the draft Water text to properly table the existing community watersheds and the proposed community watersheds, in terms of important information, such as area and previous watershed assessments. We have provided a table with some of this information.

BACKGROUNDER.

The conflicts over management activities within drinking water watersheds has been a controversial issue since the early 1960s, when changes to the provincial government's policy of protection from resource management activities evolved to allow resource use activities (initially introduced as "multiple use", now "integrated resource management") in these watersheds. Ongoing/persistent concerns by residents, incorporations, and municipalities led to the first formal provincial review and inquiry, established by the Environment and Land Use Technical Committee (ELUTC), in 1972, the *Task Force on the Multiple Use of Community Watersheds*. A key concern identified by British Columbia water users, through a questionnaire distributed to over 300 water users by this Task Force, was logging. As a result of the growing concerns, two important events occurred.

1. The Task Force created over 300 *Land Act* Watershed Reserves (see list below for those in the Lillooet Plan Area) to provide various levels of protection to community watersheds. Other community watersheds did not receive this legislation. A key component to any management activities conducted in these Watershed Reserves was a referral system between key government ministries, a policy which apparently failed from the outset. Aside from these Watershed Reserves,

with their own public review process, called the Integrated Watershed Management Process (IWMP), the provincial government created a management policy for Community Watersheds under the Forest Practices Code Act, in 1995.

2. A 1975 resolution passed by the Associated Boards of Health was to permit medical health officers the lead authority in decisions over management activities in these watersheds, a resolution usurped by the inter-ministerial Task Force in 1976. In this sense, it is not surprising that, amongst the many resolutions passed over a period of decades by the Union of B.C. Municipalities regarding forest management activities, the B.C. Medical Association passed a resolution in 1999 for "protection" of B.C. Community Watersheds from resource management activities.

Since the 1960s, the science of forest hydrology, conducted mostly through professionals in the United States, has identified that logging and roadbuilding cause long-term cumulative impacts to the alteration of water quantity and quality. Linked to the issue of water quality, is the matter of other resource use practices, such as cattle grazing and mining on both surface water and groundwater sources.

Because of decades of mismanagement activities in community watersheds, the B.C. Auditor General recently released a limited review report on the state of community watersheds, *Protecting Drinking-Water Sources* (March 1999). This report points to the self-understood fact that community watersheds deserve special considerations in B.C. resource management policies. Relatedly, the Auditor General has recommended that a separate provincial agency be created to oversee community watersheds and drinking supply sources. There is an outstanding need for an in-depth public review of government legislation that mandates commercial activities in public drinking supplies.

WATERSHED RESERVES

Unfortunately, there is no mention or assessment of existing *Land Act* Watershed Reserves in both the Lillooet LRMP DUC (Draft Under Construction), and the Okanagan/Shuswap LRMP document. This is not surprising, because when the provincial government created the Forest Practices Code Community watersheds in 1995, it simply incorporated the *Land Act* Watershed Reserves in the category of Forest Practices Code Community Watersheds without a proper explanation of their legislative history and assimilation. Most of the Watershed Reserves in the Lillooet Plan Area are attached in the accompanying table. We say "most", because we were unable to verify the existence of other Watershed Reserves created in the Lillooet Plan Area after 1980.

WATERSHED RESERVES - LILLOOET DISTRICT			
WATERSHED	CATEGORY	NUMBER	AREA
Dickey Creek	One	3A	5.7 sq. miles
Lytton Creek	One	6	3.9 sq. miles
Towne Creek	One	3B	5.0 sq. miles
Fergusson Creek	Two	1	13.7 sq. miles
Murray Creek	Three	5	53.6 sq. miles

[The above table lists the Watershed Reserves in the Lillooet Plan Area, taken from *Appendix G*, of the *Guidelines for Watershed Management of Crown Lands Used as Community Water Supplies*, Ministry of Environment, October, 1980.]

Management guidelines for these *Land Act* Watershed Reserves were outlined in a Ministry of Environment document, *Guidelines for Watershed Management of Crown Lands Used as Community Water Supplies*, in October 1980, including a series of appendixes. Each of the Watershed Reserves were categorized in terms of area: category one reserves, under six square miles; category two reserves, between 6 and 35 square miles; category three reserves, over 35 square miles. For management planning in these watersheds, each were to endure a rigorous public process, called Integrated Watershed Management Plans (IWMPs). According to the 1980 Guidelines document (otherwise referred to as the 'Blue Book'), category one Watershed Reserves are "for all practical purposes, those designated for maximum protective measures". Category two and three reserves, according to the guidelines book, are less restrictive, in terms of planning purposes, because of their areas. In many ways, the implementation of the 1980 Guidelines document remains controversial, due to the fact that the 1972 Task Force was created because of the persistent complaints from B.C. residents and incorporations in the late 1960s and early 1970s from resource use activities in community watersheds.

CONSERVATION INTEREST RECOMMENDATIONS REGARDING COMMUNITY WATERSHEDS

Because of the significance that Community Watersheds have for health and water quality issues related to human consumption and use, and in light of the recent public prominence that drinking water has received both in B.C. and in Canada, we suggest the following recommendations for previously developed and undeveloped Community Watersheds and for proposed candidates for Community Watersheds:

1. That, in the interim (regarding the Auditor General's recommendation), the Ministry of Environment, Lands, and Parks become the lead agency for Domestic and Community Watersheds in the Lillooet Plan Area. Such a transfer of power will help to alleviate development pressures on Community Watersheds, pressures that cause deterioration to water quality concerns and conflicts within communities. There are two important considerations behind our recommendation:

> **One.** The recent decision by the Chief Forester to transfer lead agency authority from the Ministry of Forests to the Ministry of Environment, Lands and Parks in the Greater Vancouver watersheds, the source of water supply for half of B.C.'s population, is an important precedent.
> **Two.** The recommendation by the Auditor General for a separate lead agency to oversee community watersheds in B.C.

2. Previously developed Community Watersheds. That there be a deferral of resource planning initiatives in designated and proposed community watersheds that have had previous development activities, until such time as detailed watershed assessments have been conducted. We cannot properly determine the period of deferral, and suggest a window of five years.

3. Undeveloped Community Watersheds (listed on page 4.19-25). That there be a deferral of management plans and activities in these watersheds (and other candidate Community Watersheds which may not be listed), until such time as formal base line data has been conducted.

4. That communities who may transfer their water supply from surface-fed watersheds to groundwater sources maintain a backup supply in case of emergencies, where groundwater sources may become contaminated.

LILLOOET DISTRICT COMMUNITY WATERSHEDS			
WATERSHED	**REFERENCE #**	**AREA (ha)**	**ASSESSMENTS**
Blackbird	100.057	29	-
Countless	100.058	66	-
Dickey	100.060	1,485	-
Dicksam	100.061	15	-
Fergusson	100.062	3,228	-
Fountain	100.063	8,087	-
George	100.064	470	-
Gladwin	120.011	939	-
Inklyulnkinatko	100.210	20	-
Intlpam	100.067	5,698	-
Lytton	100.068	988	-
Mcintyre	100.085	20	-
Murray	120.021	14,945	yes
Nekliptum	100.230	254	-
Nepuchin	100.072	738	-
Nikaia	100.073	2,063	-
Omin	100.211	187	-
President	100.075	112	-
Retasket	100.076	4	-
Six Mile	120.023	556	-
Towne	100.081	1,200	-

TEXT SECTION 2. FINAL LILLOOET LRMP PHASE 1 FRAMEWORK PLAN - Conservation, Recreation, Tourism and Community, April 23, 2001

[Note: the following is cited from pages 22-24 of the text.]

5.1.4 Community Watersheds / Domestic Water

1) Introduction

Water is an essential resource that is available as surface or groundwater. A key consideration for this LRMP is protection of water quantity and quality for human consumption. This reflects the longstanding provincial interest in protecting drinking water. As communities continue to grow and prosper within the Lillooet LRMP area, the demand on community and domestic water supplies will also continue to grow. It is important to consider future water needs during resource development in order to ensure that an adequate volume of clean water continues to be available to all residents. Most domestic use water use is provided through surface water flows, both for communities and for individual users Groundwater is also chosen as a water supply where surface water is not readily available, is of lower quality or has higher treatment costs. There is currently inadequate groundwater management and protection in the Plan area, due to lack of legislation, limited resources, and information. Management of aquifers is an area of concern in the plan area. The provincial government has classified aquifers located at Lillooet (one east and one west of the Fraser River), D'Arcy and Seton Portage according to their level of use and vulnerability to contamination. There is an additional unclassified aquifer running directly under the Village of Lytton. All of these aquifers are located in valley bottoms and partly up valley sides where land is primarily under private ownership. However, upland drainage areas, which provide recharge to these aquifers, are predominantly Crown lands and also need adequate protection. As local and regional governments have control over valley-bottom land use, they need this aquifer information to plan growth and land use to minimize adverse impacts on groundwater.

It is estimated that there are approximately 300 water licenses for domestic use within the Plan area. There is also a substantial amount of unlicensed use for domestic purposes. There are approximately 20 community watersheds within the Plan Area presently designated under the Forest Practices Code of British Columbia Act. In addition, there are two applications for this designation, from the Gun Lake Rate Payers and Buck Creek water licensees. There are other areas within the plan area where community watershed designation may be appropriate (e.g. Marshall Lake, Tyax/Tyaughton Lake, Pavilion area, Antoine Creek), but applications have not been submitted by the water licensees in these areas. Recommending additional community watershed designations was considered during the LRMP, but it was decided that this was not appropriate without applications from the water licensees for the areas.

Key water quality concerns for most parts of BC relate to deterioration by sedimentation, nutrient loading, contamination, and waterborne diseases. These water quality concerns exist in the Lillooet plan area as well. Water monitoring is occurring in two community watersheds (Murray and Nekliptum Creeks). Water quality objectives for community watersheds have not yet been set by MELP, including water quality objectives for forestry related activities.

Issues in the plan area with respect to drinking water are:

i.) Potential for loss of water quantity, quality and timing of flow due to resource development or use, which has a negative impact on licensed water use;

ii.) Domestic water use licensees sometimes are not fully informed about plans for development and use in the watersheds from which they draw water; and
iii.) Domestic water use licensees sometimes feel their input is not considered in decisions about resource development in watersheds from which they draw water.

2) Key Definitions

See the glossary in Schedule A.

3) Strategic Level Goals

Drinking water is recognized as a critical resource which is managed for both use and protection, ensuring water quality and quantity are maintained, and, where needed, restored.

4) Strategic Level Recommendations

These recommendations are made with the knowledge that the government is creating a Drinking Water Protection Plan. These recommendations should be reconciled with this plan once the plan for drinking water is finalized.

Watersheds with Domestic Water Licenses:

a) Protect, maintain, and where needed, restore water quality, quantity and timing of flow in watersheds with domestic water use licenses, as indicated by levels of turbidity and sediments and flows that remain within the natural range, both on a seasonal and event basis.
a) Domestic water use licensees will be fully informed of planned development or use within the watershed upstream of the point of diversion for their license including:
   - Ministry of Environment, Lands and Parks, Water Branch, will maintain accurate records of domestic water use licenses, as required by the Water Act. This agency will provide a digital map of this information and an electronic version of the contact names and addresses to ministries responsible for reviewing and approving development and use proposals;

The scale of "planned development or use" that would trigger referral will be defined in Phase 2.

Policy Advice to Government: The Water Act should be updated to require that more detailed and accurate information on domestic use water licenses is available. Any information to be provided to the public should not be subject to Privacy Rules.

- Ministries responsible for reviewing and approving development and use proposals will provide proponents with the current listings and maps of domestic water use licensees, from the Ministry of Environment, Lands and Parks;
- Establishment of ongoing communications by development proponents with domestic water use licensees early in the planning process;
- Domestic water use licensees will receive direct notification of the formal public review of development or use, and their opportunity to comment; and
- Development or use proponents will directly inform domestic water use licensees who provide comments in writing of how their concerns have been addressed.

b) If a domestic water use or waterworks licensee is not satisfied that the concerns they raised in writing are adequately addressed by a development or use proponent, they can initiate a 'local referral process' as follows:
   - The water use licensee will secure a written opinion by a hydrologist assessing the level of risk to water quality, quantity or timing of flow (considering both hazard and consequences) due to the proposed development or use;
   - The hydrologist's judgement will be provided to the Lillooet District Community Resources Board who will designate Board members or others to review the concerns, with the assistance of a professional hydrologist from a government agency;
   - The Community Resources Board designates will provide advice, in writing, to the development or use proponent to better address the concerns of the water licensees, and provide information to the statutory decision maker, in writing, regarding the decision to be made; and

   [Note: If the Community Resources Board is unwilling or unable to perform this function, then an alternative will be developed in Phase 2.]
   - This process must be completed within the timeline that the statutory decision maker would make a decision on the proponent's plan in the current regulatory framework, unless seasonal conditions make it impossible for the hydrologist or the local referral group to complete necessary site assessments.

c) To be approved, development plans must contain provisions for:
   - Addressing the concerns of domestic water use licensees that are provided in writing during public review; and
   - Consulting domestic water use licensees throughout further planning as required.

e) Domestic water use licensees will be fully informed of the reasons for approval of industrial resource development or use in the watershed upstream of the point of diversion for their license. The scale of development that would trigger referral will be defined in Phase 2.

f) Implement a water quality/quantity issues survey of all water users during Phase 2. Feedback from this survey will be used in the development of a drinking water management plan.

Community Watersheds

a) During Phase 2, assess the cumulative impacts and levels of risk to drinking water supplies in designated and candidate community watersheds from all industrial developments and land use with a view to limiting impacts to water quality and quantity in the next five years.

b) Identify candidate community watersheds and upgrade to community watershed status.

c) Implement a water quality/quantity issues survey of all water users within the plan area during Phase 2. Feedback from this survey will be used in the development of a drinking water management plan.

d) Until a new agency is defined to manage drinking water as recommended by George Morfitt, Auditor General of British Columbia, the Ministry of Environment, Lands and Parks should become the lead agency for land management decisions in community watersheds and watersheds with licensed domestic use.

e) Develop a comprehensive drinking water management plan for the area.

f) Communities who switch from surface-fed water supplies to groundwater sources should maintain the surface-fed supply as an emergency back up if groundwater sources become contaminated.

TEXT SECTION 3. THE CAMPBELL GOVERNMENT'S MARCH 11, 2002 SECOND REVISIONARY DRAFT OF THE APRIL 2001 LILLOOET LRMP TEXT

[Note: In December 2001, seven months after the Liberals were elected, the newly created Ministry of Sustainable Resource Management (MSRM) re-drafted the April 2001 Lillooet LRMP text document, ratified by the previous provincial NDP government and Table. The Conservation Sector refused to participate in the redrafting of the document, and on March 11, 2002 is when the MSRM produced the second draft. In July 2004 is when the Liberal government released its latest version.]

3.19. Water Resources

Introduction

Water is an essential resource available as surface or groundwater. As water is a finite resource, water availability and water quality have the potential to impact regional growth and economic development. BC Hydro is the largest licensed user of water resources in the plan area, as it regulates water on the Bridge River and Seton River systems by a series of dams. Second to BC Hydro, the agriculture industry is the largest user of water. Growth of the agriculture industry (on both private and Crown lands) and industrial development are dependent on the availability of water.

Water is a crucial component of the plan area's ecosystems, as the lakes and rivers and riparian areas associated with these water bodies provide habitat and food for fish and many wildlife species. The key consideration for this LRMP is protection of water quantity and quality. As communities continue to grow and prosper within the Lillooet LRMP area, the demand on domestic water supplies will also continue to grow. It is important to consider future water needs during resource

development in order to ensure that an adequate volume of clean water continues to be available to all current and future residents.

There is considerable variation in precipitation from west to east. In the western watersheds, near the Coast Mountains, there are thick forests and large ice fields and annual precipitation may be around 2000 mm. Lillooet, in the eastern end of the plan area, lies within the dry Interior and has annual precipitation of 300 to 400 mm. Due to the semi-arid climate, much of the plan area is dependent on the runoff from winter snowpack at higher elevations.

The plan area contains two major river systems - the Bridge River and Seton River, which flow into the Fraser River on the eastern flank of the plan area. As well, the Thompson River flows through Spences Bridge and into the Fraser River at Lytton. Other significant watercourses are Cayoosh Creek and Portage River (Seton River system); Yalakom River, and the Stein River.

Key water quality concerns for most parts ofBC relate to deterioration by sedimentation, nutrient loading, contamination, and waterborne diseases. Some water quality monitoring data are available for the Bridge River, Yalakom River, Carpenter Lake, Cadwallader Creek, lower Lajoie Creek, Gun, Pavilion, Lajoie Lakes, Hell and Condor Creeks. Data indicate that high metal levels may be present in some areas (Carpenter Lake, Gun Creek), and that water quality is very variable throughout the plan area. More up-to-date and detailed sampling is necessary to determine whether actions are needed to address water quality issues. Water quality in mainstream lakes throughout the plan area is generally good.

Storage Dams

Major Dams: BC Hydro operates three hydroelectric generating facilities within the plan area, supplying power to the provincial transmission grid. There are two dams on the Bridge River, Lajoie Dam and Terzaghi Dam and one on the Seton River. The primary operating objectives of this system are for hydroelectric power generation, flood control and the maintenance of minimum flow. Downstream water supply, fisheries, wildlife habitat, and recreational activities are considered in the operation of these facilities.

Minor Dams: There are six minor dams (less than 10 metres high) in the plan area. These structures are mostly located on the East Side of the Fraser River (with the exception of the Moore Lake reservoir on the west side) and are used to store water for irrigation. Future development will need to consider storage of water as an option that will be dependent on the availability of water and suitability of storage sites. Further studies, especially for agriculture, need to be completed to assess the potential for storing water.

Groundwater

The provincial government classifies aquifers according to their level of use and vulnerability to contamination. Classified aquifers are located at Lillooet (one east and one west of the Fraser River), D'Arcy and Seton Portage. There is an unclassified aquifer at Lytton. All of these aquifers are located beneath privately owned land (in valley bottoms and partly up valley sides) that is under the jurisdiction of local government. Upland areas, however, that provide recharge to these aquifers, are predominantly Crown land. Because of this, provincial and local governments both have a role in managing impacts to groundwater.

Issues

- Lack of water quantity (flow) monitoring information;
- Lack of inventories of water available for storage and use for domestic, agricultural and industrial development and conservation purposes;
- Lack of water allocation planning, which includes analysis of seasonal water flows, licensed use and ecological needs;
- Concerns that current water licensing decisions, and water use practices, do not adequately account for the water needs for fish habitat, and aquatic ecosystems;
- Concern about actual and potential water shortages, especially on arid sites;
- Concerns that the impacts of development on water quality and quantity are not fully considered during planning the development of some watersheds;
- Water quality is at risk of contamination;
- Groundwater management and protection is hampered by insufficient information, limited resources and a lack of legislation; and
- Concerns about the potential to divert water from the plan area for export.

Goals

To protect, maintain and restore water quality and quantity throughout the plan area for healthy domestic drinking water and productive fish habitat and aquatic ecosystems, as well as agricultural and industrial use.

Objectives & Strategies

1. Improve the understanding of the water resources in the plan area.
    1.1 Maintain the existing hydrometric monitoring stations in the plan area, and add new stations; facilitate sharing of water monitoring and watershed assessment data broadly including the general public and stakeholder organizations.
    1.2. Conduct water discharge analysis to define the timing and level of water flows.
    1.3. Inventory water storage opportunities for domestic, agricultural and industrial development.
    1.4. Define methodologies to determine the water needs (instream flows) for fish and aquatic ecosystems, and identify instream flows where this information is needed for water allocation planning for a specific watershed.
    1.5. Unlicensed domestic water use should be registered with the agency responsible for the allocation of water rights so their use is known and can be considered in resource planning and licensing decisions.
    1.6. In watersheds where there are water shortages, conduct water allocation planning, including accounting for groundwater which contributes to water supply.
    1.7. Create an inventory of stream systems with licensed use where water conservation is required to restore fish habitat or aquatic ecosystems.
    1.8. Research management practices to increase water yields from dry ecosystems.
    1.9. Continue existing baseline water quality monitoring.

2. When making water licensing decisions, balance applications for licensed water use with the needs of fish and aquatic ecosystems. Existing water rights will be retained where beneficial use and other license requirements are met (as defined under the Water Act).

2.1. Small scale hydro generation should be considered a high priority use of available water when it can be shown that instream resources have been adequately accommodated.

3. Prioritize watersheds requiring assessments (Interior Watershed Assessment Procedures) using the Lillooet Forest District Watershed Screening Tool (August 2000).

See the Fish and Riparian Ecosystems sections for further direction

3.19.1. Community Watersheds and Watersheds with Domestic Water Licenses

Introduction

A key consideration for this LRMP is drinking water quality and quantity. As communities continue to grow and prosper within the Lillooet LRMP area, the demand on community and domestic water supplies will also continue to grow.

Most drinking water, both for communities and for individual users, comes from surface sources. Groundwater is used where surface water is either not readily available, or of lower quality, or has higher treatment costs.

About 20 community watersheds in the plan area are now designated under the *Forest Practices Code of British Columbia Act* (see *Community Watersheds and Watersheds with Domestic Water Licenses Map*). In addition, there are two applications for community watershed designation - one from the Gun Lake Rate Payers and the other from Buck Creek water licensees. There are other areas where community watershed designation may be appropriate (e.g., Marshall Lake, Tyaughton Lake. Pavilion area, Antoine Creek), but applications have not been submitted by the water licensees in these areas. [1] There are an estimated 300 water licenses for domestic use and a substantial amount of unlicensed use, as licensing is not required by current legislation.

For most of BC, drinking water quality concerns relate to deterioration by sedimentation, nutrient loading, contamination, and waterborne diseases. These concerns also exist in the plan area. Water monitoring is occurring in two community watersheds (Murray and Nekliptum Creeks), however, water quality objectives for community watersheds have not yet been set.

Issues

- Potential loss of water quantity and quality and changes in flow patterns due to resource development or use
- There are increasing concerns that issues about the safety of drinking water may lead to conflicts between resource users where livestock grazing and agricultural water use occurs in watersheds which are, or will be, designated as community watersheds.
- Intake locations for licensed domestic use are often not accurately mapped, and there are no records of the substantial unlicensed domestic use.

[1] Recommending additional community watershed designations was considered during the LRMP, but it was decided that this was not appropriate prior to formal application for community watershed status by the water licensees for these areas.

• Domestic water users/licensees are sometimes not fully informed about plans for development and use in the watersheds from which they draw water
• Domestic water use licensees sometimes believe their input is not considered in decisions about resource development in watersheds from which they draw water
• Domestic water use licensees sometimes do not feel they are fully informed how and why decisions are made regarding development and use activities in the watershed from which they draw water.

Goals

To recognize drinking water as a critical resource and manage for both use and protection. To maintain, or where needed, restore drinking water quality and quantity.

Objectives & Strategies [2]

Community Watersheds

1. In designated community watersheds (see Community Watersheds and Watersheds with Domestic Water Licenses Map), continue to implement existing legislation, regulations and guidebooks as amended periodically by regulatory agencies.

See the Range section for objectives and strategies regarding livestock use within community watersheds.

Watersheds with Domestic Water Licenses

1. In watersheds with water licences for domestic [3] drinking water (see *Community Watersheds and Watersheds with Domestic Water Licenses Map*) protect, maintain, and where needed, restore water quality, quantity and timing of flow (e.g., turbidity levels and flows that remain within natural ranges, both on a seasonal and event basis).

1.1. Statutory decision makers and resource developers or users should address water quality, quantity and timing of flow in development and use plans in these watersheds.

2. Foster improved communication between license holders and proponents of resource developments; make available opportunities for public comment on resource development plans; and ensure that written comments are addressed in project review and approval processes.

2.1. Encourage domestic water licensees and unlicensed domestic users to register their interests in, or concerns about, resource developments or use proposals with the development proponent and the appropriate regulatory agencies (e.g.. Ministry of Forests, Ministry of Energy and Mines, Ministry of Sustainable Resource Management, Land and Water BC, Ministry of Water, Land and Air Protection).

2.2. Encourage domestic drinking water use licensees to use available internet-based mineral resource information to acquaint themselves of mineral exploration activities in their watersheds.

[2] Note: These guidelines are made with the knowledge that the province is reviewing the *Drinking Water Protection Act*. They may need to be revised once the review is complete.
[3] "Domestic" may include institutional users of drinking water.

2.3. Maintain accurate records of domestic water use licenses, as required by the Water Act (Note: The agency currently responsible for this act is Land and Water BC of the Ministry of Sustainable Resource Management). Encourage unlicensed domestic users to register their use.
2.4. Land and Water BC of the Ministry of Sustainable Resource Management should provide maps and licensee contact information to regulatory agencies and proponents of resource developments.
2.5. Development proponents should directly notify domestic water licensees of proposals for resource developments and use that are planned to occur in the watershed, within two kilometres upstream of a point of diversion, and identify opportunities for comment in project review and approval processes. (Note: For mineral exploration and development this would apply only to construction of exploration access)
2.6. Domestic drinking water use licensees should provide written comments regarding any concerns to development proponents within timelines provided for public comment.
2.7. Development proponents should respond in writing to domestic water use licensees' queries as to how their concerns have been addressed.
2.8. Regulatory agencies should ensure that development plans address written comments provided during public reviews.

TEXT SECTION 4. THE CAMPBELL GOVERNMENT'S JULY 22, 2004 REVISION RELEASE OF THE 2001 LILLOOET LRMP

2.4.2 Water

Issues:
• Water shortages exist, and are likely to worsen, resulting in competition for limited water supplies.
• Water licensing decisions need to account for the water needs of fish, fish habitat and aquatic ecosystems.
• Water allocation planning, which includes information and analysis of seasonal water flows, licensed use, and ecological requirements, is needed.
• An inventory of available water (e.g., quantity and flow information) for agricultural and industrial development, domestic use, storage, conservation purposes, and fish, is needed.
• Development plans and decisions need to consider potential impacts to water quality and quantity.

Goals:
• Balanced water management that provides for:
- safe, reliable and accessible drinking water
- industrial development; and
- fish, fish habitat and aquatic ecosystems

Objectives	Management Direction/Strategies	Measures of Success/Targets	Intent
1. Improve information about water use and availability	1.1. Inventory water storage opportunities for domestic, agricultural and industrial development and instream flows	Water available for development, storage and water licensing opportunities.	

	1.2. Encourage domestic drinking water use licensees to use available internet based mineral resource information to acquaint themselves of mineral Exploration activities in their watersheds		
2. Improve information about water quality, quantity and timing of flow	2.1. Research management practices to increase water yields from dry ecosystems 2.2. Continue existing baseline water quality monitoring	Easily accessible (e.g., website) and accurate water licence, water monitoring, and watershed assessment data. Adequate monitoring of water quality and quantity	
3. Ensure adequate instream flow requirements for fish, fish habitat and aquatic ecosystems	3.1. Instream flow requirements established for fish and aquatic ecosystems		
4. Address existing and potential water use conflicts in all watersheds with shortages	4.1. In watersheds where there are shortages, conduct water allocation planning	Water allocation plans exist for watersheds with existing or potential water use conflicts	
5. Manage resource development and use activities to maintain ground and surface drinking water sources, including water quality, quantity and timing of flow	5.1. Resource development plans address water quality, quantity and timing of flow 5.2. Special care to protect water quality in watersheds with domestic use	100 %	
6. Maintain hydrologic stability in all watersheds contributing to fish habitat and licensed domestic water use	6.1. Encourage licensees to prioritize watersheds requiring assessments 6.2. Incorporate First Nations traditional use and knowledge in these assessments where available 6.3. Encourage forest licensees to complete assessments on all prioritized watersheds	Hydrologic assessments completed for drainages where there is evidence of destabilization or potential destabilization	Use tools such as the Lillooet Forest District Watershed Screening Tool (August 2000)
7. Improve communication amongst water users, development proponents, and resource agencies to minimize conflicts about water use and resource development	7.1. Facilitate sharing of water monitoring and watershed assessment data broadly, including the general public and stakeholder organizations	Water tenures implemented without conflicts Resource development in watersheds with water tenures	Easily accessible (e.g., website) and accurate water licence, water monitoring, and watershed

			assessment data.