

# Peace River Regional District

## Lakeshore Development Guidelines



July, 2000



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The Moberly Lake Community Association;  
The One Island Lake Rate Payers Society;  
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## **EXECUTIVE SUMMARY**

The Peace River Regional District Lakeshore Development Guidelines is a policy document that has been prepared in response to growing pressures for development around lakeshore areas in the region. The policies and guidelines in this document specifically pertain to all private land located within 300 metres of the high water mark of those lakes generally surrounded by private land, and which are within the community planning areas of the Peace River Regional District.

The general intent of the document is threefold:

1. To provide the public with important educational and background information on lakeshore ecological and development issues;
2. To provide developers with valuable conservation guidelines which can be used for construction projects in proximity to lakeshore areas, streams and ecologically sensitive areas; and
3. To provide the Board of the Peace River Regional District and Development Services Staff with development policies and conservation guidelines for specific lakes in the region, in order to assist in the decision making process for future development proposals.

This document recognizes there must be a balance, between preservation of ecological resources and the desire to develop lakeshore properties. It is further recognized that, although much of the land surrounding a lake may be private property, lakes are ultimately considered to be a public resource and should therefore be accessible to all those who wish to use and enjoy them in a responsible manner.

It is hoped that the consultation process, which has involved feedback from individual property owners, community groups and technical staff from various provincial agencies, has resulted in a final product that has appropriately addressed the concerns of the general public.

**TABLE OF CONTENTS**

<b><u>1.0 INTRODUCTION</u></b>	1
<b><u>2.0 LAKE MANAGEMENT ISSUES</u></b>	1
2.1 Ecological Conservation	1
2.2 Watershed Management	1
2.3 Land Use Activities	2
2.4 Accessibility	2
2.5 Development Proposals	2
2.6 Infrastructure	3
2.7 Responsibility	3
<b><u>3.0 PROJECT OVERVIEW</u></b>	3
3.1 Project Scope	3
3.2 Project Goals	3
3.3 Project Objectives	3
3.4 Methodology	4
3.5 Application	4
3.5.1 Local Government Level	4
3.5.2 Senior Government Level	5
<b><u>4.0 KEY REFERENCES</u></b>	5
<b><u>5.0 REGIONAL STAKEHOLDERS</u></b>	5
5.1 Community and Conservation Groups	5
5.2 First Nations Groups	6
<b><u>6.0 LAKE ECOLOGY</u></b>	6
6.1 Aquatic Habitat and Environmentally Sensitive Areas	6
6.2 Temperature	7
6.3 Dissolved Oxygen	7
6.4 Eutrophication	7
6.5 Riparian Zones	8
6.6 Leave Strips	8
6.7 Wetlands	8
<b><u>7.0 IMPACTS FROM LAKESHORE DEVELOPMENT</u></b>	8
7.1 Land Usage	8
7.2 Point and Non-Point Sources of Pollution	9
7.3 Nutrient Loading	9
7.4 Sediment Loading	9
7.5 Inappropriate Residential Development	9
7.6 Private Lot Development	10
7.7 On-Site Sewage Disposal Systems	11
7.8 Inappropriate Recreational Use	12

7.9 Impacts from Agricultural Activities	12
7.10 Impacts from Industrial Activities	12
7.11 Access and Road Construction	12
<b><u>8.0 GENERAL DEVELOPMENT AND SUBDIVISION GUIDELINES</u></b>	<b>13</b>
8.1 Lot Development and Construction	13
8.1.2 Site Layout and Clearing	13
8.1.3 Soil Erosion Control	14
8.1.4 Drainage and Sediment Control	14
8.1.5 Retaining Vegetation Leave Strip	15
8.1.6 Building Setbacks	16
8.1.7 Septic Field Setbacks	16
8.1.8 Road Construction	16
8.2 Subdivision Guidelines	17
8.2.1 General Location	17
8.2.2 Design	17
8.2.3 Access	17
8.3 Routine Activities	17
8.3.1 On-Site Sewage Systems	18
8.3.2 Yard Maintenance, Landscaping and Gardening	18
8.3.3 Automobile Maintenance	18
8.3.4 Boating	18
8.3.5 Dock Construction	18
<b><u>9.0 LAKE CLASSIFICATION AND DEVELOPMENT POLICIES</u></b>	<b>19</b>
<b><u>10.0 AGRICULTURAL LAKES</u></b>	<b>19</b>
10.1 Intent	19
10.2 Criteria	19
10.3 Specific Development Guidelines	19
<b><u>11.0 DEVELOPMENT LAKES</u></b>	<b>20</b>
11.1 Intent	20
11.2 Criteria	20
11.3 Specific Development Guidelines	21
<b><u>12.0 LIMITED DEVELOPMENT LAKES</u></b>	<b>21</b>
12.1 Intent	21
12.2 Criteria	21
12.3 Specific Development Guidelines	21
<b><u>13.0 NATURAL ENVIRONMENT LAKES</u></b>	<b>22</b>
13.1 Intent	22
13.2 Criteria	22
13.3 Specific Development Guidelines	22

<b><u>14.0 SPECIAL CASE LAKES</u></b>	22
14.1 Intent	22
14.2 Criteria	23
14.3 Specific Development Guidelines	23
<b><u>15.0 IMPLEMENTATION OF LAKESHORE DEVELOPMENT POLICIES</u></b>	23
15.1 Considerations	23
15.2 The Blanket Approach to Conservation	24
15.3 The Development Permit Approach	24
15.4 Other Regulatory Tools	24
15.4.1 Provision of Parklands	25
15.4.2 Screening and Landscaping	25
15.4.3 Soil Removal and Deposition Controls	25
15.4.4 Tree Cutting Permits	25
15.4.5 Conservation Covenants	25
15.5 Incentive Tools	25
15.5.1 Riparian Property Tax Exemptions	25
15.5.2 Density Bonuses	25
15.5.3 Comprehensive Development Provisions	25
<b><u>16.0 RECOMMENDATIONS</u></b>	26
16.1 Development Permit Areas	26
16.2 Watershed Management	26
16.3 Coordination with Local Health Unit	26
16.4 Planning for Community Sewage Systems	26
16.5 Coordination with Community Groups	26
16.6 Implementation	26
16.7 Public Consultation	26
16.8 Senior Government Conformance	26
16.9 New Developments	26
<b><u>APPENDICES</u></b>	
Appendix A - Lake Classification Matrix	28
Appendix B - Summary of Public Input and Technical Committee Recommendations	31
Appendix C - List of Government Agencies	39
Appendix D - Interest Groups	41
Appendix E - Lake Classification Criteria	42
Appendix F - Bibliography	45

## **1.0 INTRODUCTION**

The Peace River Regional District is a vast region covering over 120 000 square kilometers in area, and contains hundreds of lakes ranging in size from less than one hectare to over eighteen square kilometers. The majority of the smaller and medium sized lakes remain in their natural state, while some of the larger ones, such as Charlie, Moberly and Swan Lakes, are experiencing increased development pressures and human activities along their shores.

Local governments throughout the province have taken a more active role in managing development around lakeshore areas in recent years in an attempt to protect water quality, preserve indigenous ecosystems and minimize negative impacts from human activities. The Peace River Regional District realizes that in most instances some forms of lakeshore development can be accommodated without serious negative impacts to water quality and ecological resources. The major challenge is to balance the desires of all lake users without compromising the future ecological integrity of lakes.

These guidelines outline a number of basic measures that can be used towards the protection of our lakes. In the long term, these measures are more cost effective than reacting to problems that may have traditionally been ignored. People will find that these guidelines are easy to administer and should require no more than basic common sense.

## **2.0 LAKE MANAGEMENT ISSUES**

### **2.1 Ecological Conservation**

A single lake is made up of many different parts including land, water, dissolved chemicals, gases, plants and animals. Each of these parts work together as a whole in a complex way known as an ecosystem. The ecosystem of a lake represents thousands of years of natural construction that has responded to local conditions. As will be discussed, any disruption to the delicate balance of these ecosystems can potentially lead to irreversible damage to entire lakes.  
(Environment Canada, 1997)

### **2.2 Watershed Management**

A single lake is an extension of a larger network of streams, rivers, groundwater systems, wetlands and other lakes - collectively known as a “watershed”. The natural systems within a watershed are generally resilient enough to be able to adapt to a limited amount of development and human uses. However, when development and human uses increase beyond the carrying capacity of a watershed, and the diversity of species that define its healthy ecosystem is reduced, then the ability of that watershed to rehabilitate itself also declines. This is why the management and stewardship of a lake should ideally include the management of the entire watershed.  
(Community Greenways, 1996)



### 2.3 Land Use Activities

Land use activities near lakeshore areas in the Peace River Regional District primarily consist of residential, commercial and recreational developments, along with a significant amount of agricultural, forestry and oil and gas activities. The clearing of natural vegetation and wildlife habitat for development around our lakeshore areas, inputs of industrial waste pollutants and run-off from fertilizers and animal wastes can all have significant impacts on the health of a lake.

### 2.4 Accessibility

Access to lakeshore areas can be a contentious issue. When private development gradually fills in the perimeter of a lake, there becomes fewer places available for the public to access the lakeshore and enjoy recreational activities. In that lakes are considered to be a public resource,



*Public Beach at Swan Lake Provincial Park*

access should not be completely denied by private development. There is however a limit to lakeshore accessibility that needs to be recognized, because an increase in accessibility can result in increased pressures for private development and overuse from the public.

### 2.5 Development Proposals

The form, intensity and type of development near our lakes all need to be carefully considered when reviewing development proposals. Approving subdivision and development proposals on an ad hoc basis, with no consideration environmental ramifications or aesthetic values, can lead to development patterns that are ecologically unsustainable. Whether or not a lake can accommodate future development, based on its present ecological characteristics and existing development around its shore area, is the central focus to these guidelines.

## **2.6 Infrastructure**

Road and sewage infrastructure near lakeshore areas can be both detrimental and rehabilitative to a lake's ecology. While road construction leads to increased accessibility, it can also raise expectations for future development and decrease the amount of permeable surface area around a watershed. Properly maintained modern sewage systems can assist in protecting water quality, but can also raise the level of expectations for development opportunities. Modern community sewage systems are currently found near Charlie Lake in the North Peace region and Kelly Lake in the South Peace region.

## **2.7 Responsibility**

As lakes are considered to be both a non-renewable and public resource, it is ultimately the responsibility of each and everyone of us to be aware of the fragility of these ecosystems and to curtail actions that can lead to their degradation. Government policies and regulations are essentially useless without a commitment towards conservation from all lake users.

## **3.0 PROJECT OVERVIEW**

### **3.1 Project Scope**

The guidelines and policies within this document are intended to be considered for development on all private land in proximity to lakes in the Peace River Regional District. There are forty-one lakes that have been chosen for specific analysis and development policies. The majority of these lakes are surrounded by private land and all are found within the community planning areas of the Peace River Regional District. Please refer to the lake classification matrix in **Appendix A** for a complete list of lakes within the project's scope.

### **3.2 Project Goals**

1. To establish pro-active development policies that will assist the Regional Board and staff in the management of land use activities found in proximity to lakeshore areas, wetlands and watercourses, so that their environmental values will be protected.
2. To provide valuable educational information and conservation guidelines for those who intend to develop land adjacent to lakeshore areas.
3. To recognize the ambitions, aspirations and concerns of public and private interests, and strive for a balance between these interests and the preservation of our lake resources.

### **3.3 Project Objectives**

1. To appropriately manage development on private lakeshore lands, while promoting the integration of economic activities that are deemed to be suitable within the lakeshore area.

2. To protect the water quality of lakes and their related environmental resources including:
  - wildlife habitat and waterfowl nesting areas;
  - riparian areas and aquatic vegetation; and
  - fish spawning and rearing habitat.
3. To maintain the recreational and public use potential of lakes, while preserving the aesthetic quality of their natural setting.

### 3.4 Methodology

The goals and objectives of these guidelines will be achieved by:

- developing a classification system that categorizes each lake on its potential to accommodate future development activities;
- developing guidelines that outline specific conditions for development proposals based on the classification of a lake;
- consulting with a technical committee comprised of provincial agency representatives; and
- organizing public meetings and consulting with interest and stakeholder groups

See **Appendix B** for a summary of public input and technical committee recommendations.

### 3.5 Application

**These guidelines apply to private land situated within 300 metres of the natural boundary of those lakes which are located within the official community planning areas of the Peace River Regional District. The guidelines and policies within this document are not regulations nor are they intended to suggest that the Peace River Regional District intends to expropriate private land.**

The guidelines in this document are intended to promote and provide ideas for responsible development practices within proximity to lakes, streams and watercourses. Further, the policies in this document will be used to assist the Regional Board and Development Services Staff in the review of development proposals and future land use plans for land located in proximity to lakes, streams and watercourses.

Regulatory responsibility of lakeshore development activities is distributed between the jurisdiction of local, provincial and federal governments.

#### 3.5.1 Local Government Level

At the local government level, regional districts have traditionally been responsible for adopting and administering subdivision, zoning and development permit regulations, pursuant to the provisions of the Municipal Act. Recently, with the introduction of Bill 26 - the Local Government Statutes Amendment Act, 1997, the powers of regional districts to protect, restore and enhance the natural environment, its ecosystems and bio-diversity have been broadened.

### 3.5.2 Senior Government Level

Provincial agencies that have significant involvement in lakeshore management include BC Environment which regulates all in-stream works and development adjacent to the high water mark; the Peace-Liard Community Health Services Society which regulates all sewage disposal licencing; the Provincial Agricultural Land Commission which regulates development activities on lands within the Agriculture Land Reserve (ALR); the Ministry of Transportation and Highways which regulates access to watercourses and has the final approving authority for all subdivisions proposals; and, the BC Assets and Lands Corporation which regulates all development activities on Crown lands, including foreshore leases and permanent dock construction.

At the federal government level Agriculture Canada, the Department of Fisheries and Ocean, Environment Canada, can each have significant involvement in lakeshore development proposals.

Please refer to **Appendix C** for a complete list of government agencies involved with lakeshore management issues.

## **4.0 KEY REFERENCES**

In 1982, a document titled **Lake And Waterway Policies - Regional District of Peace River-Liard** was prepared for the Peace River Regional District. This document was not officially adopted by the Regional Board at that time nor has there been any similar project adopted since. It has however been used as a valuable reference for these guidelines.

The **Charlie Lake Official Community Plan Bylaw No. 907, 1994**, incorporates a *Shoreland Management Area* strategy for Charlie Lake. This strategy includes specific objectives and policies towards lakeshore development, some of which have been adopted into these guidelines.

Regional districts throughout the province have adopted lakeshore development policy manuals, including the 1991 **Lakes Study Policy Manual of the Thompson-Nicola Regional District Planning Department**, and the 1994 **Lakeshore Guidelines for the Regional District of Fraser-Fort George**. These documents are well written and have been regarded as successful planning tools for those regions. They are both referenced throughout these guidelines.

The 1997, **Fort St. John Land and Resource Management Plan** identifies specific *Resource Management Zones* (RMZs) for Charlie, Cecil and Boundary Lakes in the North Peace region. These RMZs include recommendations for specific management initiatives toward issues concerning fish and wildlife, water quality and recreation. This document is an excellent reference for anyone who is interested in land use issues in the North Peace region.

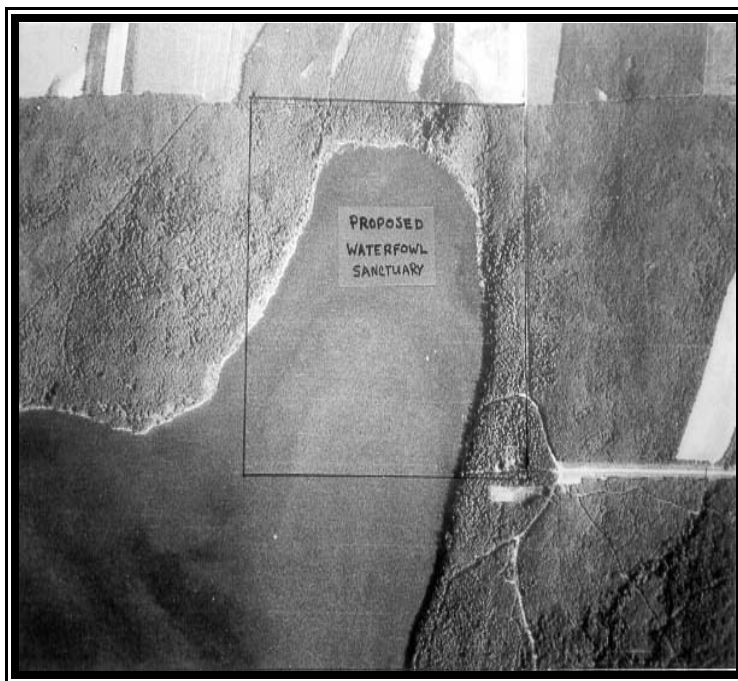
## **5.0 REGIONAL STAKEHOLDERS**

### **5.1 Community and Conservation Groups**

There are a number of conservation and local community groups with an interests in lakes of the

region. (see Appendix D). Ducks Unlimited is the largest of these organizations having numerous project sites throughout the region. There are also a number of smaller - yet equally significant - community groups including the Charlie Lake Conservation Society, the Moberly Lake Community Association, and the One Island Lake Rate Payers Society.

The Charlie Lake Conservation Society is one example of a volunteer organization that takes initiatives in providing public education initiatives and stewardship practices. The presence of conservation groups in our region has become increasingly important as government resources allocated to managing and maintaining parks are in decline.



*The aerial photograph to the right identifies a specific shore area of Charlie Lake north of Beaton Provincial Park, that has been proposed for a waterfowl sanctuary by proponents of the Charlie Lake Conservation Society.*

## 5.2 First Nations Groups

The Saulteau and West Moberly Lake First Nations groups each have reserves on the eastern and western shores of Moberly Lake. These two groups have traditionally played an active participatory role within the Moberly Lake community.

## 6.0 LAKE ECOLOGY

Understanding how a lake “works” requires knowledge of the geology, land uses, local climatic conditions, hydrology, soil conditions and external human activities within a lake’s watershed. All of these variables influence the amount and quality of water flowing into a lake. Factors such as the size, shape and depth of a lake influence the manner in which a particular lake is able to naturally retain a level of water quality. (Moss, 1998)

### 6.1 Aquatic Habitat and Environmentally Sensitive Areas

Wetlands, rivers, lakes and riparian zones, are commonly referred to as aquatic environmentally sensitive areas (ESAs), which have high values for fish and aquatic habitat, flood protection, scenery and recreation. Aquatic ESAs can be negatively impacted by even the slightest disturbances and thus should be protected wherever possible. There are different methods of protecting and maintaining ESAs either through voluntary stewardship programs or, as is the case in some communities, by legislation. (Stream Stewardship, 1994)

## 6.2 Temperature

Lakes in British Columbia can show a variety of annual temperature patterns based on their geographic location and depth. In general, lakes form layers with the coldest summer waters near the bottom. Because colder water is denser, it resists mixing into the warmer and lighter upper layer for much of the summer. During spring and fall, these lakes usually mix from top to bottom as wind energy overcomes the reduced temperature and density differences between the surface and bottom layers; while in winter, lakes re-stratify under ice with the warmest water near the bottom. (Carmichael, 1998)

## 6.3 Dissolved Oxygen

Oxygen enters a lake water column from the air through wind action and plant photosynthesis. The oxygen within a lake is then consumed by the respiration of living aquatic organisms, and by the decomposition of dead aquatic organisms. Lakes that are unproductive will have sufficient oxygen throughout the year at all depths. However, when lakes become more productive as a result of increased plant and animals respiration and larger quantities organism decay, then more oxygen consumption occurs, especially near the lake bottom where dead organisms accumulate. (Carmichael, 1998)

## 6.4 Eutrophication

The productivity of a lake is measured by its ability to produce plants and algae. Generally, as the productivity of a lake increases from inputs of phosphorus and nitrogen compounds, its “trophic” status changes. Lakes that are deep and cold usually produce little aquatic life and are referred to as being “oligotrophic”. At the other extreme, shallow and warm lakes that are highly productive are referred to as being “eutrophic”, and usually contain an abundance of aquatic vegetation, algae and fish stocks.

It is important to realize that lakes can *naturally* become more eutrophic over time without human influences. When the processes of eutrophication advance within a lake, the morphology of that lake is subject to change. This change is dependant on the amount of water that diminishes through additional loads of organic sediment and land rooted plant species, which can gradually infill the perimeter and shallow areas of naturally eutrophic lakes. Advanced symptoms of eutrophication can lead to extreme algae and aquatic plant growth, and, in extreme cases, can result in fish kills if aquatic plants consume the majority of a lake’s oxygen supply. (Environment Canada, 1997)

When lakes become extremely eutrophic and consumed by weeds and excess algae, the lake becomes less desirable for recreational activities, drinking water and other human uses. This situation is presently found in many lakes throughout the southern interior of British Columbia, where lakes have experienced extreme symptoms of cultural eutrophication resulting from high inputs and non-point sources of phosphorous and nitrogen from fertilizers, sewage effluents from urban development, and livestock manures from ranching and grazing activities.

## 6.5 Riparian Zones

The technical definition for a riparian zone is “land lying adjacent to the bank of a river or stream” (Stewart, 1998). For the purposes of these guidelines the riparian zone refers to all of the natural vegetative cover along a lake’s shore zone.

Riparian vegetation provides a lake with aesthetic qualities and functions in regulating growth for other lake species by providing sources of oxygen, food and shelter. The roots of riparian vegetation reduces erosion by stabilizing shoreline banks, and are also able to siphon off pollutants and nutrients that could otherwise eventually leach into a lake. The Fort St. John Land and Resource Management Plan and Canadian Land Inventory maps both indicate that important wildlife habitats in the Peace River region are found within riparian zones along lakeshore areas.

## 6.6 Leave Strips

Any linear section of a riparian zone that remains in its undisturbed state during development of lakeshore property is defined as a “leave strip”. According to the 1992 Land Development Guidelines for the Protection of Aquatic Habitat, “the primary objective of a leave strip is to protect the riparian zone, which is critical to the maintenance of a healthy aquatic environment”. Guidelines for maintaining leave strips are listed in Section 8.5 of this document.

## 6.7 Wetlands

“Wetlands” is a collective term for marshes, swamps, bogs and other similar water laden areas. Inland wetlands in the Peace River region receive water from various sources including precipitation, ground water systems and waterways. Wetlands are considered to be a vital component of a lake’s ecosystem as they have the ability to filter out nutrients and pollutants that would otherwise find their way into a lake. During the filtration process, wetlands have the ability to improve water quality, regulate water flows to reduce flooding, and recharge groundwater supplies. Equally important, wetlands also provide production and staging areas for birds, spawning grounds for fish, and habitat for many species of wildlife. (Fraser-Fort George Regional District, Lakeshore Guidelines, 1994; Osmond et al., 1995)

## 7.0 IMPACTS FROM LAKESHORE DEVELOPMENT

### 7.1 Land Usage

When humans develop and alter the landscape, the natural cycle of a watershed becomes disrupted. Different types of land uses can impact the water quality of a lake in different ways. In the Peace River region, residential development, agricultural production, and road building for the oil and gas and forestry industries, are some of the main types of land use activities that can be found in close proximity to lakeshore areas.

While inappropriate development of an individual lot may not seem significant, the potential for long-term damage resulting from cumulative developments on our lakes and watersheds cannot be underestimated. It is also necessary to understand the basic concepts of point and non-point source pollution, nutrient loading and sediment loading.

## **7.2 Point and Non-Point Sources of Pollution**

Point sources of pollution are locations where there are direct discharges of pollutants into lakes and watercourses. Non-point sources of pollution originate from sources of pollutants that are located some distance from the end. These pollutants eventually diffuse into or over the ground and are then transported by streams and groundwater systems into lakes. This is why it is crucial to maintain wetlands, leave strips and riparian areas wherever possible. Altering the natural landscape by clearing vegetation for development can lead to erosion, accelerated run-off and decreased infiltration capacities of the soil, which in turn can lead to increased water pollution.

## **7.3 Nutrient Loading**

The flushing of daily household items such as laundry detergents and toxic cleaning agents, and the use of fertilizers and agricultural by-products such as manure around lakeshore areas, are typical examples of non-point sources of pollution that can load a lake system with phosphorus and nitrogen. Under the right conditions, excess inputs of these chemicals accelerate aquatic plant and algae growth which can eventually lead to advanced stages of eutrophication.

If phosphorus and nitrogen inputs are reduced or halted a system may be able to recover by itself. Case in point: in the late 1960s, Lake Erie experienced such an extreme case of eutrophication that fish were dying and the decomposing algae that washed up onto beaches had to be removed with bulldozers. The phosphate used in laundry detergents washed into the lake was identified as the main culprit. Legislation was passed to reduce the substance and in 1972 laundry detergent phosphate contents were cut by approximately ninety percent. The water quality of Lake Erie has since made a significant recovery. (Environment Canada, 1997)

## **7.4 Sediment Loading**

As was mentioned in Section 7.2, when the natural vegetative cover of a landscape is cleared for development, its surface becomes more impervious and the ability of the ground to absorb water decreases. The result is an increased potential for erosion. The potential for erosion is also dependant on the geological composition of the ground and the levels of precipitation in an area.

The geological composition of the Peace River region is dominated by sedimentary rock. Erosion of unconsolidated sedimentary rock can result in relatively high sedimentation loading into the nearby lakes and waterways. When the level of sedimentation within a lake increases, the water becomes less hospitable for fish habitats and less desirable for human uses. It is therefore important to realize that land development involving the removal of vegetation can lead to higher rates of run-off and erosion.

## **7.5 Inappropriate Residential Development**

Residential development near lakeshore areas is usually found adjacent to the immediate shoreline. This type of linear development can be problematic when it denies public access to water, creates unsightly and unnatural shoreline characteristics, and offers the lowest capacity for development while causing the greatest environmental damage. Furthermore, the density of



residential development around a lakeshore can signify the degree of crowding perceived by residents and lake users. The “crowdedness” of a lake is considered to be one of the most subjective values associated with lake use for recreational and residential purpose. (Thompson Nicola Regional District, Lakes Study Policy Statement, 1991)

### 7.6 Private Lot Development

For each individual lot, the removal of riparian vegetation, the construction of retaining walls, and the placement of fill, are some of the main activities that can have negative impacts on lake ecology. The properties shown in the photographs below provide both a poor example (Example 1) and a good example (Example 2) of single lot residential development practices:



#### Example 1:

Most of the **riparian vegetation** has been cleared along the lake frontages of these properties, and some of the dwellings are situated adjacent to the high water mark of the lake. This type of development practice, on a larger cumulative scale, can be detrimental to a lake’s ecology.

*Source: (1999) Limnological Aspects of Charlie Lake (Peace River Drainage, British Columbia): A Summary of Data Collected Between 1974 and 1995.*

#### Example 2:

This lot has a **leave strip** of vegetation retained along its shore area, and the cottage is situated an appropriate distance from the highwater mark.



The following information was produced by BC Environment and provides a useful summary of how various human activities on lakeshore lands can impacts fish habitat:

ACTIVITY	IMPACTS
<p><b>Increased Sediment and Nutrients Loads and Toxic Run-off:</b></p> <ul style="list-style-type: none"> <li>&gt; due mainly to poorly placed or faulty septic systems, detergents, lawn and garden fertilizers and livestock,</li> <li>&gt; from storm drain run-off, and</li> <li>&gt; from poor clearing practices for roads, driveways and buildings.</li> </ul>	<ol style="list-style-type: none"> <li>1. Water quality deterioration.</li> <li>2. More algae and aquatic weed growth.</li> <li>3. Oxygen depletion and fish kills.</li> <li>4. Inputs of toxins such as gas, oil, heavy metals and salts</li> </ol>
<p><b>Removal of Natural Aquatic &amp; Riparian Vegetation:</b></p> <ul style="list-style-type: none"> <li>&gt; to “clean up” the shoreline and remove weeds, and</li> <li>&gt; to create lawns and open up views.</li> </ul>	<ol style="list-style-type: none"> <li>1. Loss of fish habitat, shade and cover.</li> <li>2. Loss of insects and bottom-dwelling organisms which are important to fish production</li> <li>3. Loss of bank stability leading to an increase erosion, and increases effects of nutrients and toxic run-off.</li> </ol>
<p><b>Shoreline Zone Infilling / Retaining Walls</b></p> <ul style="list-style-type: none"> <li>&gt; to increase useable land</li> </ul>	<ol style="list-style-type: none"> <li>1. Buries food organisms.</li> <li>2. Covers spawning beds, both in lakes and outlet streams.</li> <li>3. Destroys fish rearing habitat.</li> <li>4. Chemicals from treated wood and new concrete are toxic to fish.</li> </ol>

(Source: *Lake Care, BC Environment*)

### 7.7 On-Site Sewage Disposal Systems

Similar to nutrients from fertilizers, the nutrients found in sewage contribute to eutrophication. These nutrients consisting of nitrates and phosphates contribute to the growth of plants and photo-synthetic algae. The plants and algae later decompose using up available oxygen. The rate at which this occurs depends on the biochemical oxygen demand (BOD) When the BOD in a lake is high, the decomposition rate of the sewage slows down and the pollution problem is exacerbated. (Moss, 1983)

Compact clays which are common in the Peace River region can prevent the absorption of septic waste material resulting in sewage diverting overground and entering water bodies. Underground disposal of sewage in areas consisting of clayey soils is not permitted by the local health authorities. Any on-site sewage disposal system within areas of substrates comprised of compact clay is currently restricted to sewage lagoons constructed under permit.

In areas where effluent is able to percolate easily through soil, underground septic fields may be licenced instead of sewage lagoons. Subsurface treatment is sufficient to remove sewage bacteria and the organic matter that contributes to BOD, however, it may not remove all of the nutrients that contribute to eutrophication. Therefore it is recommended that underground sewage disposal

systems be located as far back from the shoreline as possible. The current sewage disposal policy in the Peace River region requires a minimum setback of thirty metres for sewage lagoons and septic fields. (Peace Liard Community Health Services Society, 1999)

### **7.8 Inappropriate Recreational Use**

Camping, boating, hiking and off-road exploration activities near lakes can be carried out without damaging lakeshore ecology provided that these activities are done in a caring and responsible manner. Shoreline disturbances caused from excessive wave action from power boats, Sea-Doos and Jet-Skis operating too fast and close to a shore can damage waterfowl habitats and increase shoreline erosion.

### **7.9 Impacts from Agricultural Activities**

Agriculture is the third largest economic activity in the Peace River region today. Farming and grazing activities in proximity to lakes can have negative impacts on the water quality if proper land management techniques are not properly administered. When eroded sediments from soils and fertilizers finally reach a lake, the phosphorus and nitrogen chemicals in the fertilizer can accelerate the productivity of the lake and the increased sediment loads can make the water less desirable for human use.

Grazing activities near lakes can also have negative impacts on water quality. One head of cattle can produce as much waste as ten people and the nutrients found in its waste can reduce water quality at an alarming rate. Of particular concern is the location of large feedlots which can contain thousands of animals in a relatively small concentrated area. As well, free roaming livestock are naturally attracted to riparian areas for water, shelter and forage, which can result in high animal densities near water, the destruction of riparian areas, and increased erosion of stream banks. (Watershed Stewardship, A Guide For Agriculture, 1997)

### **7.10 Impacts from Industrial Activities**

Petroleum and natural gas extraction activities are the most significant economic activities in the Peace River region today. The waste materials associated with these activities can be harmful to the environment, particularly if the waste streams find their way into a lake system. While some of the waste materials involved are organic in nature and can be naturally bio-degraded, the more toxic hydrocarbons and inorganic heavy metal substances can not be broken down as easily and will tend to remain in a still water body for long periods of time. (Moss, 1983)

### **7.11 Access and Road Construction**

The clearing of vegetation and indigenous ground cover for road construction can have negative impacts on water quality and destroy wildlife habitats. Road surfaces are generally designed to be impervious which results in increased surface run-off over cleared areas and right-of- ways. Poorly maintained drainage ditches and clogged culverts can lead to increased erosion and sedimentation loading into lakes and streams.

## **8.0 GENERAL DEVELOPMENT AND SUBDIVISION GUIDELINES**

These general guidelines should be considered for all new development and subdivision proposals within 300 metres from the high water mark (referred to as the “shore zone”) of all lakes in the Peace River Regional District. Ideally, these guidelines should be considered for all development and subdivision proposals that are within proximity to any stream, watercourse, and wetland throughout a watershed. Prior to any subdivision or development proposal, property owners are encouraged to check with the Peace River Regional District to confirm the following:

- the zoning and official community plan designation of the property;
- the classification of the lake;
- the ALR status of the property; and
- whether the property being proposed for development or subdivision lies within a Development Permit Area, Preservation Area or any other Special Management Area.

Notwithstanding any guidelines in this section, in situations where these guidelines conflict with an official community plan, land use bylaw or other similar bylaws of the of the Peace River Regional District, the policies, objectives and regulations written into the official community plan, land use bylaw or similar bylaws will take precedence over these guidelines.

### **8.1 Single Lot Development and Construction**

The following single lot development guidelines have been adopted from the 1992 “Land Development Guidelines for the Protection of Aquatic Habitat”, published by the Department of Fisheries and Oceans and the Ministry of Environment, Lands and Parks.

One of the main objectives during the development of an individual lot is to minimize erosion and transportation of sediments off of a site. The following should be considered in terms of proximity to shore zones and watercourses:

- planning the construction access;
- minimizing clearing and grading activities;
- controlling excavated soil and properly locating stockpiles;
- consideration of the surface and slope conditions; and
- planning for surface runoff control measures.

#### **8.1.2 Site Layout and Clearing**

Prior to construction, the following measures should be considered whenever possible:

- design and layout of the building site to minimize impervious areas;
- retain existing vegetation and ground cover wherever possible;
- minimize clearing and stripping of setbacks and easements;
- restrict vehicle access and provide surfaced working areas; and
- clearly mark the building area and clearing boundaries on the site.

### 8.1.3 Soil Erosion Control

Surface soil erosion from individual lot and building sites is mainly due to excavation and grading activities. Erosion on a site can be mitigated by:

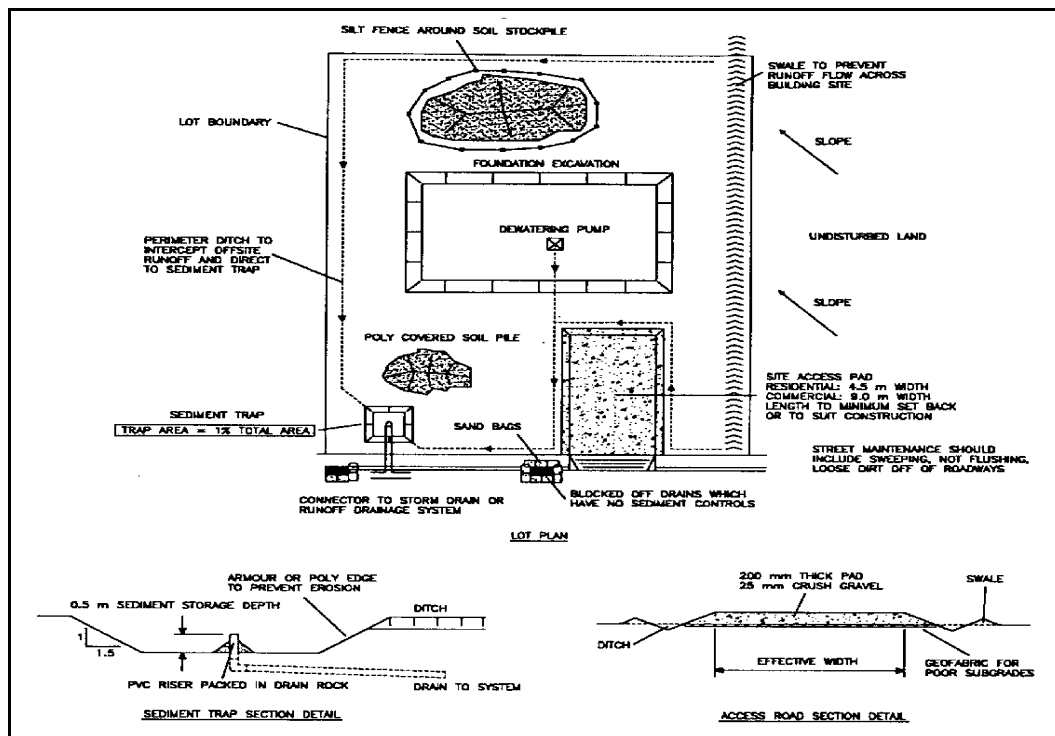
- covering temporary fills or soil stockpiles with polyethylene or tarps;
- prompt re-vegetation of the landscape on disturbed areas; and
- limiting machine access and operation to prepared access areas only.

### 8.1.4 Drainage and Sediment Control

Site drainage control can usually incorporate sediment control mechanisms that can limit the offsite transport of sediments directly into a lake or waterbody. Here are some basic guidelines:

- divert runoff away from cleared areas by using swales or low berms;
- utilize silt fences around soil stockpiles and sloped areas;
- collect runoff into site sediment traps prior to discharge off the site; and
- divert runoff towards vegetated areas.

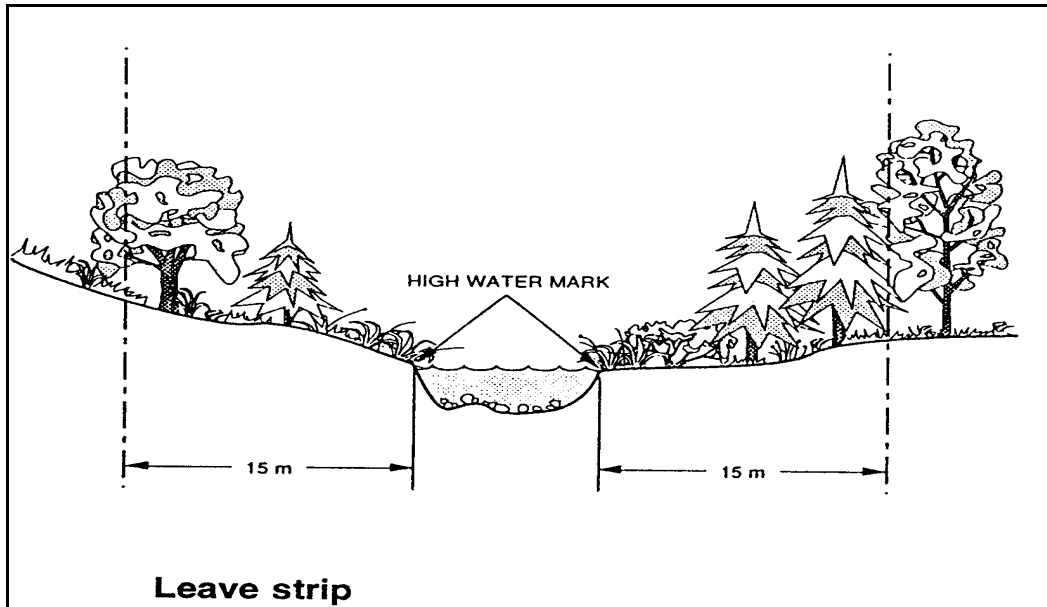
The following diagram depicts a conceptual site preparation plan with methods for on-site drainage management and measures for soil and sediment erosion control:



*Please note that this diagram is very generalized and may not provide sufficient enough details for construction projects on lots with complex slope and terrain conditions. For additional information on drainage and sediment control tactics, developers are encouraged to refer to the Land Development Guidelines for the Protection of Aquatic Habitat (1992), which is the source of this diagram.*

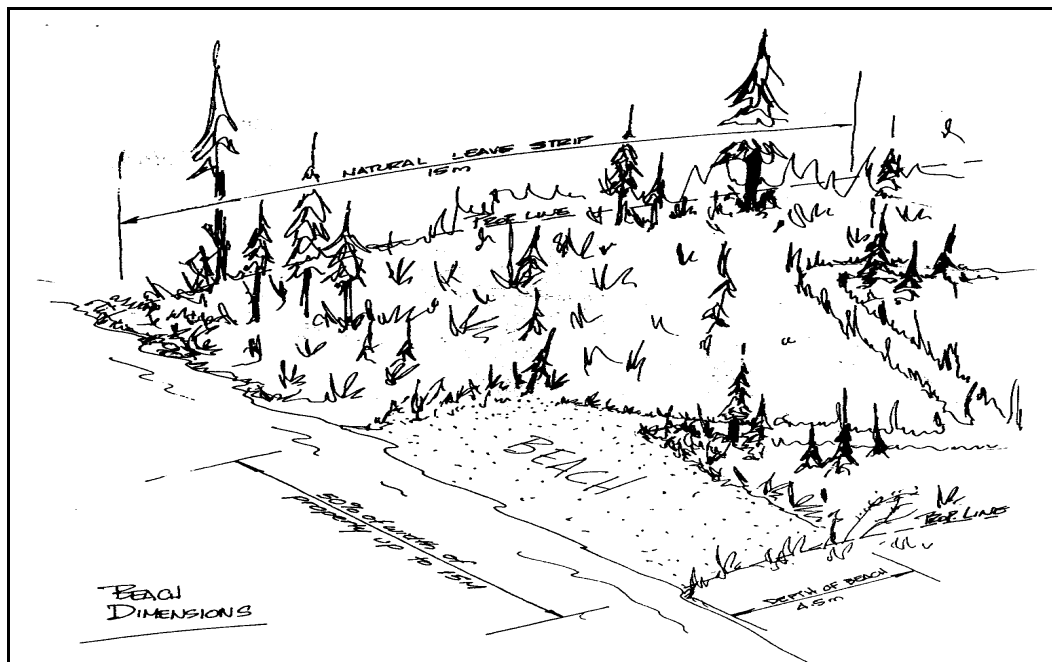
**8.1.5 Retaining Vegetation Leave Strip**

- ❑ Leave strips should be kept to a minimum of 15 metres in width from the high water mark of a lake or stream.



*Source: (1992) Land Development Guidelines for the Protection of Aquatic Habitat*

- ❑ No more than 50 % of a parcel frontage adjacent to a lake up to a maximum of 15 metres should be cleared for beach development or for waterfront access. The depth of a cleared beach should be no greater than 4.5 metres from the high water mark of a lake.



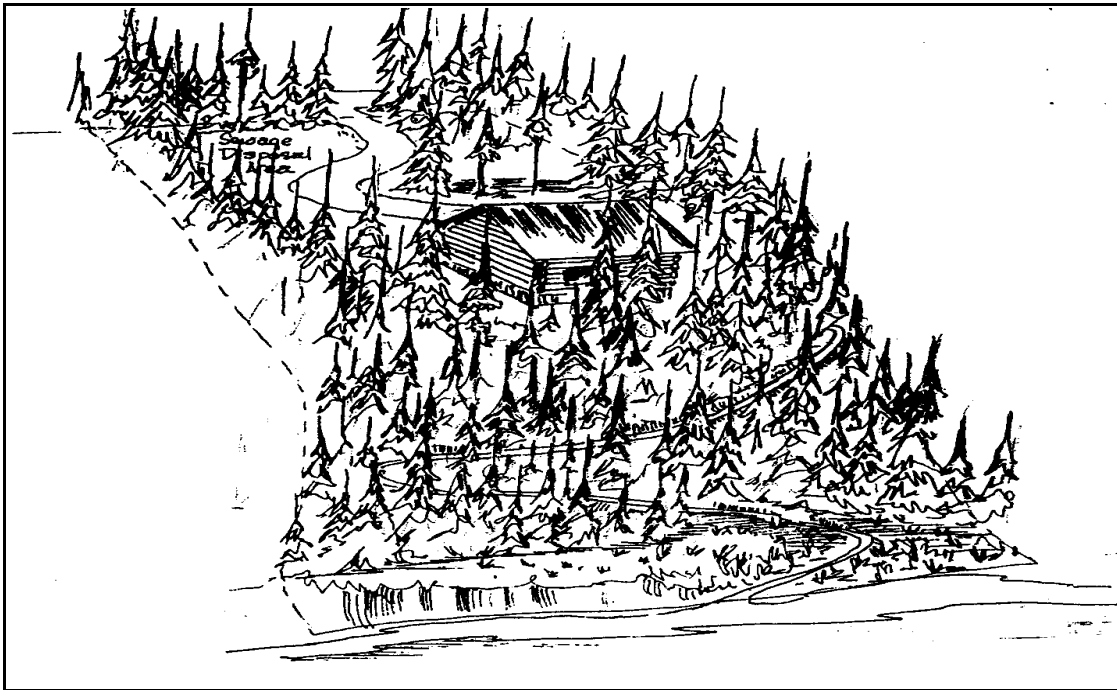
*Sketch produced by Gordon Simmons*

### 8.1.6 Building Setbacks

Unless otherwise specified, all buildings should be located at least 15 metres from the high water mark of a lake or stream.

### 8.1.7 Septic Field Setbacks

Where there is no community sewage system in place, all on-site sewage and septic fields require a permit from the Peace Liard Community Health Unit. The Health Unit requires that all on-site sewage disposal systems and septic fields be located at least 30 metres from the high water mark. Depending on results of soil percolation tests the Health Unit may require a greater setback area. Developers are encouraged to locate their septic fields as far away from the lakeshore as possible.



*Sketch produced by Gord Simmons*

### 8.1.8 Road Construction

Road construction should be kept to a minimum within the shore zone. Wherever roads are constructed, the following *Assessment Procedures and Prescriptions for Watershed Restoration* prescribed by the Ministry of Environment and the Ministry of Forests can be used to help prevent erosion of ditch-lines:

- grass seeding or hydro-seeding,
- drop structures,
- rip-rap,
- ditch blocks, and
- cross drains

## 8.2 Subdivision Guidelines

These subdivision guidelines should be considered for all subdivision proposals in the shore zone of any lake in the Peace River Regional District.

### 8.2.1 General Location

All subdivisions should be located in areas with appropriate site conditions. The following conditions should be avoided for any site:

- steep slopes;
- poorly drained areas;
- areas with muddy shorelines and wetland areas; and
- areas that are designated as being environmentally sensitive.

### 8.2.2 Design

Cluster subdivision designs are encouraged for all new developments within the shore zone to increase the amount of open space available for public use and habitat conservation. In order to achieve this, a developer should consider the following in a development plan:

- developing existing properties that are already cleared prior to developing other lands;
- constructing a community sewage system;
- dedicating a percentage of lakeshore land to a park or open space for public access; and
- providing a minimum parcel frontage of 55 metres for newly created lots located adjacent to the high water mark of a lake.

### 8.2.3 Access

When a property adjacent to a watercourse or lake is proposed for subdivision, the Approving Officer from the Ministry of Transportation and Highways may require the developer to dedicate road access at regular intervals to the water. Whether or not access is required depends on the size of the water body and the distance between each access depends on the size of the lots being created. In the Peace River Regional District where most of lots are equal to or greater than 0.5 hectares the access spacing is 400 metres.

The above provisions for access may not apply in certain instances where the lake or watercourse is less than a specific area or width. Developers should consult with the Ministry of Transportation and Highways to confirm the specific requirements.

## 8.3 Routine Activities

Following basic guidelines for routine household activities - such as the maintenance of yards, gardens, automobiles and on-site sewage systems - can reduce the overall inputs of pollution and nutrients into our lakes. When it comes to boating, using some simple common sense can also help keep our waters clean.



### 8.3.1 On-Site Sewage Systems

- Inspect your system yearly and have the septic tank pumped every 2 to 5 years by a septic service company. Regular pumping is cheaper than having to rebuild a drain field.
- Use low phosphate or phosphate free soaps.
- Do not put toxic chemicals (paints, varnishes, thinners, waste oils, photographic solutions or pesticides) down the drain because they can kill the bacteria at work on your on-site sewage system and contaminate water bodies.
- Conserve water by running dishwashers only when full and use low-flow showerheads, faucets and toilets. Laundry and other high use water activities should be spread throughout the week

### 8.3.2 Yard Maintenance, Landscaping and Gardening

- Replant lakeside grassed areas with native vegetation and do not import sand.
- Use plants that discourage pests and minimize high maintenance grass and turf areas.
- Reduce your use of fertilizers and pesticides.
- Do not use fertilizers in areas where the potential for water contamination is high, such as sandy soils, steep slopes, or compacted soils.
- Do not apply fertilizers or pesticides before or during rain due to the likelihood of runoff.
- Compost yard and kitchen waste and use it to boost your garden's health as an alternative to chemical fertilizers.
- Hand pull weeds rather than using herbicides.
- Use natural insecticides such as diatomaceous earth. Pesticides can kill beneficial and desirable insects, such as ladybugs, as well as pests.

### 8.3.3 Automobile Maintenance

- Fix any fuel, oil, brake, transmission and cooling system leaks immediately.
- Use drop cloth when fixing problems yourself.
- Recycle used motor oil, antifreeze, and batteries at collection centres.
- Use phosphate-free biodegradable products to clean your vehicle.

### 8.3.4 Boating

- Do not throw trash overboard or use lakes or other water bodies as toilets.
- Use phosphate-free biodegradable products to clean your boat.
- Keep motors well maintained and tuned to prevent fuel and lubrication leaks.
- Conduct major maintenance chores on land.
- Consider using electric motors or 4 cycle for cleaner emissions.
- Use absorbent bilge pads to soak up minor oil and fuel leaks or spills.
- Recycle used lubrication oils and left over paints.

### 8.3.5 Dock Construction

- Avoid using treated wood for dock construction and old fuel drums for floatation devices.

## **9.0 LAKE CLASSIFICATION AND DEVELOPMENT POLICIES**

This document incorporates a classification system that prescribes specific development guidelines and policies for each class of lake. Lakes have generally been classified on their ability or disability to accommodate future development. See Appendix A for the classification given to each of the forty-one lakes chosen for specific analysis and development policies.

The classification system used in this section is tailored to lakes in the Peace River Regional District, and incorporates a similar methodology that was used for the Lakeshore Guidelines of the Fraser-Fort George Regional District. Every attempt was made to classify each lake according to its size and degree of accessibility; existing land uses and perimeter development patterns around its shore zone; water quality and fish value data; and, Canadian Land Inventory (CLI) capability ratings for recreation, agriculture, forestry, ungulates and waterfowl. Specific criteria used in the lake class classification process can be reviewed in **Appendix E**.

**Special Case Lakes, Natural Environment Lakes, Limited Development Lakes, Development Lakes, and Agricultural Lakes** are the five different lake classes.

### **10.0 AGRICULTURAL LAKES (A)**

**10.1 Intent:** “Agricultural Lakes” have a substantial amount of farming, grazing or ranching activities around their shore zone and are usually surrounded by large parcels of land. The purpose of this classification is twofold:

- 1) to prescribe guidelines that will preserve existing agricultural activities that are in proximity to the shore zones of these lakes; and,
- 2) to protect the water quality of a lake by promoting measures that reduce inputs of animal wastes, herbicides and fertilizers, and erosion near the lakeshore.

Recognizing that the majority of lakeshore land in this class are within or adjacent to the Agricultural Land Reserve, the Regional District will consult with the Provincial Agricultural Land Commission and the Ministry of Agriculture and Foods for all development proposals around lakeshore zones.

**10.2 Criteria** - a shore zone that is within or adjacent to the ALR in addition to the following criteria:

- CLI Agricultural capability rating of 1, 2, 3 for the entire shore zone; and
- 50% or more of the shore zone has agricultural potential.

**10.3 Specific Development Guidelines:** In addition to the General Development and Subdivision Guidelines of Section 8, the following specific guidelines apply to these lakes:

- 1) All subdivision and development proposals must meet the zoning requirements of the Regional District, and have approval from the Provincial Agricultural Land Commission, the Ministry of Agriculture and Foods and the Ministry of Transportation and Highways.

- 2) When and where approved, residential subdivisions and non-agricultural developments may be considered to a maximum of 20% of the perimeter for lakes greater than 260 hectares, and 10% perimeter development for lakes less than 260 hectares.
- 3) According to the 1997 *Stewardship Series* publication “Watershed Stewardship Guidelines: A guide For Agriculture”, the following guidelines which apply for agricultural activities in proximity to watercourses and lakes should be adhered to:
  - a) riparian areas should be preserved at least 15 m wide from a stream, lake or watercourse, and protected by fences wherever possible;
  - b) access routes and buildings, should be located 15 metres away from a stream, lake or watercourse;
  - c) storage sites for petroleum, pesticides, fertilizers and other chemicals should be located at least 15 metres away from surface water and domestic water sources;
  - d) confined livestock areas (including feedlots) should be located at least 30 metres away from surface water and domestic water sources;
  - e) manure storage structures should be sited at least 30 metres away from domestic water supplies and any stream, lake or watercourse; and
  - f) berms or other works should be constructed around field storage areas if this is necessary to prevent agricultural waste that causes pollution.
- 4) Those who are proposing agricultural activities near streams or riparian areas are encouraged to consult with BC Environment regarding the *Agricultural Waste Control Regulations* of the Waste Management Act. For development on Crown land, the Ministry of Agriculture and Food has implemented the *Grazing Enhancement Fund* to assist lease holders farmers and ranchers with stewardship strategies.

## **11.0 DEVELOPMENT LAKES (D)**

**11.1 Intent:** “Development Lakes” are capable - by virtue of their physical characteristics and existing development and land use patterns - of accommodating a variety of different uses and development activities; including but not limited to residential development, agricultural activities, outdoor recreation and commercial-tourism use. The purpose of this classification is to identify lakes that can accommodate additional subdivision and development proposals within the shore zone, in a manner that does not exceed the development criteria for this class and maintains appropriate measures of conservation.

**11.2 Criteria** - a surface area greater than 260 hectares in addition to the following:

- existing perimeter development that is less than 40% on lakes less than 800 hectares, or less than 50% on lakes greater than 800 hectares;
- CLI Recreational capability rating of 1, 2 or 3; and

- existing road access.

**11.3 Specific Development Guidelines:** Subdivision and development proposals are encouraged to be planned in accordance with the General Development and Subdivision Guidelines of Section 8. Development plans may be considered provided the zoning requirements of the Regional District are met along with positive responses from the relevant provincial agencies:

- 1) to a maximum of 40 % perimeter development for those lakes less than 800 hectares;
- 2) to a maximum of 50% perimeter development for lakes greater than 800 hectares;
- 3) If, in the opinion of the Regional District and provincial agencies, a development proposal within the shore zone would have a negative impact on the water quality, shore zone environment, or an aquatic ESA, or is seen to be out of character with the existing land uses, then that proposal may be rejected.

## **12.0 LIMITED DEVELOPMENT LAKES (LD)**

**12.1 Intent:** “Limited Development Lakes” are those lakes that, by virtue of their size and existing development patterns, are only able to accommodate a limited amount of development. The purpose of this classification is to maintain a majority of undeveloped lakeshore areas which is necessary to sustain existing environmentally sensitive areas and wildlife habitat.

### **12.2 Criteria:**

- surface area greater than or equal to 60 hectares and less than 100 hectares, where existing residential development has not exceeded 20% or more of the perimeter; or
- surface area greater than 100 hectares and less than 260 hectares where existing residential development has not exceeded 30% or more of the perimeter.

### **12.3 Specific Development Guidelines:**

- 1) Development proposals are encouraged to be planned for existing lots in accordance with the General Development and Subdivision Guidelines of Section 8.
- 2) Developers are encouraged to submit a development plan demonstrating that the proposal would not negatively impact adjacent land uses, water quality and shore zone resources.
- 3) Development plans may be considered when the zoning requirements of the Regional District are met along with positive responses from the relevant provincial agencies.
- 4) If, in the opinion of the Regional District and provincial agencies, a development proposal would negatively impact the water quality, shore zone environment, or is seen to be out of character with the existing land uses, then that proposal may be rejected.

### **13.0 NATURAL ENVIRONMENT LAKES (NE)**

**13.1 Intent:** “Natural Environment Lakes” have high aesthetic qualities, recreation values and significant wildlife populations. These lakes are usually small in size and located far away from populated areas. These lakes are managed through an inter-agency approach by various provincial departments. The purpose of this classification is to introduce guidelines that restrict development in order to preserve and protect indigenous natural environments.

#### **13.2 Criteria:**

- CLI capability rating of 1,2 or 3 for Waterfowl and Ungulates; or
- CLI capability rating of 1, 2 or 3 for Forestry; or
- CLI capability rating of 1, 2 or 3 for Recreation; or
- high fish values and water quality ratings; or
- existing or proposed Ducks Unlimited project sites; and
- no existing residential or commercial land uses within the lakeshore zone.

#### **13.3 Specific Development Guidelines:**

- 1) For lakes with a surface area less than 60 hectares, development of any kind is discouraged within the lakeshore zone.
- b) For lakes with a surface area greater than 60 hectares, subdivision and residential development up to a maximum of 5% of the lakeshore perimeter may be considered when:
  - 1) a development plan meets the zoning requirements of the Regional District along with positive responses from the relevant provincial agencies; and
  - 2) when a development plan demonstrates that the proposal is planned in accordance with the General Development and Subdivision Guidelines of Section 8, and would not negatively impact adjacent land uses, water quality and shore zone resources.

### **14.0 SPECIAL CASE LAKES (SC)**

**14.1 Intent:** “Special Case Lakes” are easily accessible and characterized by a mix of different land use activities around their shore zones. Along with a significant amount of residential development these lakes are also noted to have important recreational, ecological, cultural, heritage and archeological characteristics that need to be preserved and protected. Any portion of a shore zone area of a “Special Case Lake” may be located within a Development Permit Area, or have special management policies incorporated into an Official Community Plan.

The purpose of this classification is to preserve the recreational, ecological, cultural, heritage and archeological characteristics of the lake, while recognizing the diversity of land use activities, and the potential for future development and recreational opportunities within these shore zones.

**14.2 Criteria** - a surface area greater than 800 hectares, perimeter development less than 50%, in addition to any three of the following:

- a development permit area that intersects any part of the shore zone;
- presence of any aquatic environmentally sensitive area;
- below average water quality values, low flushing rates and high trophic levels;
- existing or proposed Ducks Unlimited project site; and
- an existing community sewage system

### **14.3 Specific Development Guidelines:**

- 1) The maximum perimeter development for a Special Case lake should not exceed 50 %.
- 2) Any development proposal must at a minimum meet the official community plan policies and zoning requirements for the parcel of land, and should meet the General Development and Subdivision Guidelines of Section 8.
- 3) Where land is within a development permit area, the developer may be required to provide a comprehensive development plan requiring any of the following content:
  - an environmental assessment report prepared by a registered professional biologist
  - an erosion and sediment control plan
  - a vegetation management plan
- 4) If, in the opinion of the Regional District and provincial agencies, a development proposal within the shore zone would have a negative impact on the water quality, shore zone environment, or an aquatic ESA, or is seen to be out of character with the existing land uses, then that proposal may be rejected.

## **15.0 IMPLEMENTATION OF LAKESHORE DEVELOPMENT POLICIES**

There is a substantial amount of regulatory powers available to local governments in British Columbia to exercise for lakeshore preservation purposes. The following section discusses various regulatory options available to the Regional District to consider for implementation into future zoning bylaws, rural land use bylaws and official community plans. **The implementation of such measures would only occur upon public demand and after a thorough review involving an extensive public consultation process.**

### **15.1 Considerations**

According to the 1997 *Stewardship Series* publication “Stewardship Bylaws - A Guide for Local Government”, a regional district’s use of its authority for environmental stewardship purposes in any given situation will depend on local and site conditions related to:

- interests in environmental stewardship as reflected by the community, staff and elected officials;
- the degree of acceptance of - or aversion to - liability issues raised by taxpayers, staff,

- elected officials, owners, developers and their agents;
- biophysical conditions - terrain, soil and hydrological conditions relative to habitat;
- development conditions - degree of development, ranging from rural large parcel holdings in resource use to more altered and developed rural subdivisions;
- information, technical and financial support - by federal and provincial government agencies, local government, and environmental non-government organizations.

### 15.2 The Blanket Approach to Conservation

The bylaw blanket approach to lake conservation is the most extreme option available to local governments. This approach involves the adoption of bylaws that can apply stewardship everywhere in a regional district, including tree protection, erosion control, and watercourse protection bylaws. Development permits are used in this approach sparingly to deal with exceptional situations.

One advantage of the blanket approach is that it can be combined into a single environmental protection bylaw that could be applied to all citizens in all types of jurisdictions. The main disadvantages with this approach is that it can be costly in terms of enforcing and monitoring activities over large geographic areas, and can also require extensive front end work to ensure that regulations are appropriate for all land use types. (Stewardship Bylaws - A Guide for Local Government, 1997)

### 15.3 The Development Permit Approach

A more appropriate conservation planning tool for the Peace River Regional District is the use of development permit areas. This approach is regarded as an effective stewardship tool that involves a linkage between development permit areas that are written into an official community plan and specific development guidelines (i.e. Lakeshore Development Guidelines). According to the Municipal Act, official community plans may include policies of the local government relating to the designation of specific areas for the “preservation, protection, restoration and enhancement of the natural environment”.

In British Columbia, development permit areas have been used to ensure the conservation of lands along watercourses and near terrestrial sensitive ecosystems or hazard lands. When implementing a development permit area into an official community plan, it is first necessary to identify ESAs and other areas appropriate for conservation around a particular lake. After development permit areas are identified, they can be incorporated into an official community plan, with each permit area stipulating custom setback requirements, specific leave strip widths and erosion control measures. (Stewardship Bylaws - A Guide for Local Government, 1997)

### 15.4 Other Regulatory Tools

The following regulatory tools found in the Municipal Act and Land Titles Act are available to local governments for lakeshore conservation. They can either be written as individual bylaws, or incorporated into zoning bylaws, rural land use bylaws and official community plans.

**15.4.1 Provision of Parklands** (*Section 941 - Municipal Act*): can be used to provide areas for open space and parks along lakeshore areas. A regional district may exercise power to provide a community parks service by either designating and zoning specific areas for parks, or by requiring up to 5% of a parcel of land to be dedicated to parkland as a condition for a subdivision approval.

**15.4.2 Screening and Landscaping** (*Section 909 - Municipal Act*): a local government may require, set standards for and regulate the provision of screening or landscaping for the preservation, protection, restoration and enhancement of the natural environment.

**15.4.3 Soil Removal and Deposition Controls** (*Section 799 - Municipal Act*): to help prevent erosion, a regional district may establish services to control of the deposit and removal of soil, rock, gravel, sand and other substances of which land is composed of. This can be achieved by requiring soil removal permits, erosion control plans, and special restrictions for the grading and removal of soil, or the placement of fill in or near an ESA.

**15.4.4 Tree Cutting Permits** (*Section 923 - Municipal Act*): to help prevent erosion, a regional board may designate areas of land that it considers may be subject to flooding, erosion, land slip or avalanche as tree cutting permit areas. Alternatively, a specific bylaw may be used to regulate or prohibit the cutting down of trees.

**15.4.5 Conservation Covenants** (*Section 219 - Land titles Act*): may be may be used to ensure the long term viability of an ESA. In certain instances, public access or development could be restricted for areas other than as outlined in the written agreement.

## 15.5 Incentive Tools

**15.5.1 Riparian Property Tax Exemptions** (*Section 845.1 - Municipal Act*): property tax breaks can be granted to owners of land considered as “eligible riparian property”, in exchange for that riparian land remaining free from development. This type of agreement is written as a conservation covenant where the Regional District would be required to be the covenantee.

**15.5.2 Density Bonuses** (*Section 904 - Municipal Act*): gives an incentive for a developer to provide amenities, such as the protection of or improvement to an ESA on a parcel of land, as a condition of allowing higher density development on the remainder of a parcel.

**15.5.3 Comprehensive Development Provisions:** custom zones can be created to meet specific conditions, one of which could be for the protection of ESAs, or for the allocation of parkland.



## **16.0 FUTURE CONSIDERATIONS**

**16.1 Development Permit Areas:** the Regional District should consider options for designating site-specific development permit areas within the shore zones of those lakes classified as either “Development Lakes” or “Special Case Lakes” into future land use bylaws.

**16.2 Watershed Management:** the Regional District should consider participation with and encouragement of watershed enhancement initiatives.

**16.3 Coordination with Local Health Unit:** the Regional District should coordinate efforts with the Peace Liard Community Health Services Society to implement appropriate setback requirements for on-site sewage systems. The Regional District could explore the option of using the development permit process to ensure on-site sewage systems are adequately located.

**16.4 Planning for Community Sewage Systems:** the Regional District should consider the feasibility of supporting community sewage systems on Moberly Lake and Swan Lake.

**16.5 Coordination with Community Groups:** the Regional District should become more involved with BC Environment and community groups involved in volunteer lake monitoring programs and other similar educational programs.

**16.6 Implementation:** to implement these guidelines it is suggested that the Regional District consider the following as may be appropriate in the course of its planning activities:

- monitoring the use and effectiveness of these guidelines;
- assisting community and conservation groups in public education and voluntary lake monitoring programs;
- research possible implementation strategies for site-specific development permit areas into future land use plans;
- monitoring and enforcement of any regulatory provisions that may be adopted into future community plans or conservation land use bylaws.”

**16.7 Public Consultation:** the Regional District should ensure that the public receives appropriate opportunity to provide input with respect to any future land use bylaws and regulations, which may be instituted to implement and enforce these guidelines. Consultation should include directly informing and inviting the participation of affected stakeholders and property owners.

**16.8 Senior Government Conformance:** the Regional District will endeavour, within the scope of these guidelines, to work with and encourage senior government agencies to adhere to the requirements and spirit of these guidelines.

**16.9 New Developments:** the application of the guidelines to new developments should be included in any public meetings required for the review of such developments.

**APPENDICES**

**Appendix A - LAKE CLASSIFICATION MATRIX**

**Classification Codes:** A “Agricultural Lakes”, D “Development Lakes”, LD “Limited Development Lakes”, NE “Natural Environment Lakes”  
SC “Special Case Lakes” (Please refer to Section 9 for classification criteria)

**Geographic Area Codes:** NP (areas of private land north of Peace River and west of Rocky Mountain foothills), SP (areas of private land south Peace River and east of Pine River), WP (areas of private land west of Pine River and generally south of Peace and Moberly Rivers)

**Perimeter Development:** The perimeter of the shoreline that has been developed, in metres, for residential, recreational, commercial or industrial land uses (Please refer to Appendix D for more information on perimeter development criteria)

**Shoreline Development:** The percentage of the lake’s perimeter that has been developed

Lake	Classific'n	Geog. Area	Area (ha)	Perimeter (m)	Perimeter Develop't	% Shoreline Develop't	Comments
Alcock	A	SP	61	3392	360	11	existing Ducks Unlimited project site; affected by ALR
Beaverlodge	LD	SP	139	8192	0	0	within Kelly Lake watershed, may support limited pike populations
Big	A	WP	80	5074	280	6	popular pike fishery; affected by ALR
Boundary	LD	NP	316	10064	560	6	existing Duck Unlimited project site; significant oil and gas activities in proximity to shore areas; the Fort St. John LRMP identifies the Boundary Lake wetland area as a Resource Management Zone
Cameron	LD	WP	74	5638	90	2	popular pike fishery
Cecil	A	NP	702	15036	1480	10	existing Ducks Unlimited project site; high CLI capability ratings for waterfowl, ungulates, agriculture and recreation; affected by ALR; the Fort St. John LRMP identifies the Boundary Lake wetland area as a Resource Management Zone
Charlie	SC	NP	1820	38214	13530	35	existing sewage system; affected by ALR; Ducks Unlimited wetland restoration site at south end; populations of walleye, pike and perch; significant residential development found on the south half of lake; the Fort St. John LRMP identifies Charlie Lake and its watershed as a Resource Management Zone; 1996 PRRD public survey revealed that eutrophication is greatest environmental concern for lake users
Chinaman	NE	NP	46	2846	0	0	noted for significant trophy rainbow trout

## Peace River Regional District

## Lakeshore Development Guidelines

Lake	Classific'n	Geog. Area	Area (ha)	Perimeter (m)	Perimeter Develop't	% Shoreline Develop't	Comments
Cutbank	LD	SP	90	4043	90	2	existing Duck Unlimited project site
Davies	A	NP	31	2408	0	0	affected by ALR
Favels	NE	WP	15	2229	90	4	existing Duck Unlimited project site
Foster	NE	SP	36	3450	180	5	within Kelly Lake watershed, may support limited pike populations
Gauthier	A	SP	40	2587	270	10	within Kelly Lake watershed, may support limited pike populations
German	NE	NP	57	2802	240	9	significant oil and gas activities in proximity to shore areas
Graveyard	NE	WP	15	1820	90	5	high CLI capability ratings for ungulates
Halfmoon	NE	WP	59	7410	180	2	high CLI capability ratings for ungulates
Inga	NE	NP	60	3609	400	11	BC Forest Service Campsite; aerated, spawning channel, and highest angler effort for stocked lake trout in Peace region
Jackfish	NE	WP	30	5000	210	4	popular pike fishery; high CLI capability ratings for ungulates
Kelly	LD	SP	196	5931	720	12	existing community sewage system; limited pike fishery
Klukas	A	SP	26	2230	360	16	existing Ducks Unlimited project site; affected by ALR
Lily	LD	NP	200	6755	0	0	very shallow, would not support sport fish due to winter kills
McWaters	A	SP	31	2163	180	8	existing Ducks Unlimited project site; affected by ALR
McQueen Slough	A	SP	46	4913	630	13	existing Ducks Unlimited project site; affected by ALR
Moberly	D	WP	2910	40480	13269	33	unique large lake fishery with a diversity of species, fish populations depressed due to historic net fisheries, angler exploitation and habitat degradation; high CLI capability ratings for ungulates and recreation; significant residential development on north and south shores of lake
Monias	NE	WP	15	1834	0	0	high CLI capability ratings for ungulates

## Peace River Regional District

## Lakeshore Development Guidelines

Lake	Classific'n	Geog. Area	Area (ha)	Perimeter (m)	Perimeter Develop't	% Shoreline Develop't	Comments
Moonlight	NE	NP	61	3006	0	0	existing Ducks Unlimited project site; high CLI capability ratings for waterfowl and ungulates
Murdale	NE	NP	25	1820	0	0	high CLI capability ratings for ungulates
Murray	NE	SP	22	2070	0	0	within Kelly Lake watershed, may support limited pike populations
Norrie	NE	SP	31	2790	180	6	above average CLI capability ratings for ungulates
N. Boundary	NE	NP	99	3777	0	0	Crown land; some oil and gas activities in proximity to lakeshore
N. Sundance	NE	WP	26	2185	90	4	aerated, popular stocked trout fishery
One Island	LD	SP	206	5936	2400	40	significant fishery for large rainbow and brook trout; significant small-lot cottage development found on the eastern shore
Peavine	NE	SP	31	3515	90	3	grayling recorded within watershed, species unique for area
Rat	A	SP	5	819	90	11	above average CLI capability ratings for ungulates; affected by ALR
Scott	NE	SP	58	2864	90	3	very shallow, would not support sport fish due to winter kills
Sin	A	SP	.65	340	90	26	smallest lake recorded in study area; affected by ALR
Swan	D	SP	562	14336	2260	16	fishway installed re-establishing fish passage from Tupper River to lake body, popular fishery for pike, yellow perch and walleye; residential development found on western shore; affected by ALR
Toms	A	SP	16	1724	180	10	affected by ALR
Tower	A	SP	36	2089	180	9	existing Ducks Unlimited project site; affected by ALR
Twin	NE	SP	60	3673	0	0	surrounded by Crown land, no roads accessing lakeshore area
Whispering Pine	NE	NP	89	3776	90	2	high CLI capability ratings for ungulates
Wilde	NE	SP	20	2432	0	0	very shallow, would not support sport fish due to winter kills

## **APPENDIX B - SUMMARY OF PUBLIC INPUT AND TECHNICAL COMMITTEE RECOMMENDATIONS**

### **Part 1: Summary of Public Meetings and Public Responses**

#### **B) Public Meetings:**

In January, 2000, public meetings were held in three sub-regions of the Peace River Regional District, where the preliminary Draft of the Lakeshore Development Guidelines was presented. The responses from the three public meetings were all very similar. At each meeting there were community and conservation groups in attendance. While there were general concerns expressed at each meeting about the perceived regulatory tone of the guidelines, there also appeared to be an overall acceptance that lakeshore guidelines could be beneficial to the long-term ecological integrity of lakes in the region.

#### **General Comments**

The following provides a general summary of public responses to the draft at the three meetings:

1. Members from the Charlie Lake Conservation Society (CLCS), the One-Island Lake Rate Payers Association (OILRPA) and the Moberly Lake Community Association (MLCA), seemed to agree that the idea of lakeshore development guidelines, in some form, is a good idea. Some members from the MLCA and the CLCS stated the guidelines are a good start to protecting our lakes, and could possibly lead to future research, and perhaps even to further regulatory measures where necessary.
2. There was a general feeling of ambiguity at all of the meetings over the true intent of the guidelines. Further to this, there was a perception by many that the guidelines are already regulatory in nature, and that any future regulations emanating from the guidelines will be passed without either public notification or public involvement.
3. In regards to the above, there was a request by many who attended the meetings to have more time to review the document and more input into the final product prior to final review by the Regional Board. Some people stated that having a second round of meetings sometime in late spring or early summer would give more people, including absentee land owners, more time to review the document.
4. Some people stated that these guidelines translate into more bureaucracy and regulations that are not necessary. These people feel that lakeshore residents can take care of lakes without regulations. Others felt that the adoption of the guidelines would lead to a “rush to develop” lakeshore lands, and subsequently drive up their property taxes.
5. Various community groups expressed the opinion that the PRRD should become more involved in specific lake study programs for certain lakes in the region (i.e Moberly and Charlie Lakes); and, should also allocate more resources - in the form of money and staff time - to broader watershed management programs that would address issues such as the impacts that forestry, agricultural and industrial activities have on lakes in the region.

### **Specific Concerns**

The following notes are specific concerns that were raised at the three meeting with respect to content of the Draft Lakeshore Development Guidelines document:

1. There was a strong request to have a clear statement in the document explaining that any regulations emanating from the Lakeshore Development Guidelines into future land use bylaws would involve public consultation.
2. Members of the MLCA expressed the desire to have Moberly Lake re-classified as a “Special Case Lake” in **Appendix A**.
3. There was concern raised over the use of the phrase “...promoting the integration of economic activities...” in **Section 3.3 Project Objectives**. The concern implied that developers of commercial-tourism activities on lake shores are motivated by profit and have little regard for the ecological integrity of lakes.
4. There was substantial concern regarding the wording in **Section 6.6 Leave Strips**. Some people were under the impression that this section is implying that the PRRD intends to “expropriate” lakeshore riparian areas from property owners.
5. The owner of the cottage depicted in the photograph found in **Example 1 of Section 7.6 Private Lot Development** was upset that her cottage was used in the example for poor single-lot development practices.
6. The example of the pre-construction layout plan depicted in **Section 8.1.4** was criticized for being too generalized, because it does not consider varying slope conditions.
7. There was a specific request from the MLCA to obtain a copy of the public meeting minutes, and a copy of any proposed amendments to the project that are approved by the Regional Board.

### **B) Written Correspondence:**

1. **January 17, 2000** - Correspondence received on questionnaire form stating that the issues raised in the document are “important for the citizens who live around the lake”, but not in the form of more government bureaucracy and regulations. There were also concerns raised suggesting that the public input or involvement process is not adequate, and that the project will continue forward regardless of what input is received.
2. **January 19, 2000** - The Charlie lake Conservation Society wrote a letter of support for the Lakeshore Development Guidelines, and requested that the PRRD conduct a mail out of the questionnaire to all members of the CLCS.
3. **January 21, 2000** - Letter expressing concerns that the guidelines will turn into regulations that will be “impossible to enforce”, and further suggests that “we do not need more bylaws...”, but rather “more regulated education”.

4. **January 21, 2000** - Letter from the President of the One-Island Lake Rate Payers Association outlined the following matters they would like to see in the document:
- “That the guidelines are simply that, guidelines only, and will not now or in the future progress into policy or regulations;
  - That these guidelines are directed at new development only and not existing properties;
  - That these guidelines are not now, or in the future, intended to expropriate any property.”
5. **January 30, 2000** - E-mail from a Moberly Lake resident who states that she would like more time to review the final draft prior to adoption, and has the opinion that the 300 metre limit is too arbitrary, and that more intensified water quality studies be done.
6. **January 31, 2000** - E-mail acknowledging that lakes need to be cared for, and that there are many good ideas in the draft document. However, there is a strong concern about the recommendations in Section 6.6 regarding Leave Strips.
7. **January 31, 2000** - E-mail acknowledging that “many issues laid out in the Lakeshore Development Guidelines deserve merit”; and that self-regulation would work much better than government regulations. Similar to the previous e-mail, there was strong resentment towards the three recommendations in Section 6.6 Leave Strips.

### C) **Results from Questionnaire:**

The following public comments were received from fourteen questionnaire response forms that were returned. These questionnaires were available at the public meetings and mailed to over fifty community groups in the region. Each questionnaire addressed the eight issues listed below:

#### Lake Ecology Issues

1. **Protection of Water Quality:**
- As for Charlie Lake, the community sewer system has appeared to help somewhat! But being it has so little water flowing in and almost none out - and filled with duck poop - what can we do short of diverting a river into it!
  - Too much run-off from surrounding farmland. Lowering the lake level every fall.
  - The water quality has steadily declined in Swan Lake. It is imperative that steps be taken to eliminate the agricultural waste entering the lake and that the weed and algae growth be curtailed. A higher turnover of water in and out of the lake would also help.
  - I believe that this goal could be obtained easily if a few small scale things were monitored and adjusted ie. water levels on Charlie Lake. Until water quits running over the south end dam the lake is crystal clear, when it stops the algae blooms. Will your regulations be able to affect this.
  - It would be very hard to not give a fairly high rating on all the questions. We all want to preserve our waters for the next generation. But at what cost....more regulations? I believe that we already have enough by-laws, regulations, policies in place to look after these problems. “Education” should be the primary goal for preserving our water and wildlife. (Look at recycling - every child out there has been educated to know more about recycling than the average adult).



- Golf Course fertilization management.
- Stoddart Creek fertilization (Farms) management.
- Oil and Gas Industry is withdrawing how much water out of the lake?
- Stronger monitoring is required to prevent the dumping that went on at Charlie Lake. All lakes should be tested quarterly to catch any changes.
- By committing to #2,3, & 4 we would go a long way toward achieving number 1!
- Very important. I don't see any reason that human activities should be allowed which will degrade water quality.
- If people rank this high and others low they obviously don't know all the factors affecting water quantity.

## 2. **Preservation of Riparian Vegetation Adjacent to Lakeshore Areas:**

- Not by the three methods set out under 6.6 Leave Strips. Instead, teach land owners the importance of caring for their riparian zones.
- More important regarding new development if it goes beyond single-lot development.
- This lake (Swan) has a high degree of soil erosion around the shore at present.
- Beaver control (Aspen & Poplar).
- Coniferous forest remain (unable to log private land).
- Within reason and make property owners aware. What are the beavers doing?
- This was addressed at the LRMP and by parks.
- Vegetation (natural) surrounding lakes and drainage areas supplying lakes needs to be maintained. It may also be helpful to allow preventative measures to reduce lakeshore erosion from the water side by property owners.

## 3. **Preservation of Lakeshore Habitat:**

- Common sense has been working fine for most folks.
- Through education on control of domesticated animals and existing hunting and fishing regulations I think we could go a long way. Teaching our young children in school to respect and enjoy the animals and equally important habitat is also a must.
- Unknown habitat which could affect lake quality.
- Preserving the recreational uses and environment practices.
- This was addressed at the LRMP and by parks.
- If we are to allow development ie. cabins and recreational use on 50% must be left or maintained for aquatic habitat.

## 4. **Protection and Preservation of Environmentally Sensitive Areas:**

- From what I have seen in the last decade, most damage is done by beavers and visitors, not by the locals.
- If Regional District or any government agency needs to protect wildlife or habitat, by taking land over the owner should/must be compensated.
- The low water turnover in this lake and agricultural waste entering are quickly destroying this lake (Swan).
- Unknown environmental sensitive areas.
- Define "Environmentally Sensitive Areas". Nice catch phrase but doesn't mean much! How sensitive; sensitive to what; how big or small of an area; etc.
- Especially as pertaining to wildlife.

**Lakeshore Development and Management Issues****1. Lakeshore Development Regulations:**

- Charlie Lake's development is pretty well at its limit for the south end. Maybe for future development. It's easy to implement rules, but with cutback everywhere - who enforces them?
- Self-regulation seems to be adequate. We do not need another bureaucracy on top of the too many already there.
- Set backs for buildings that people use. Boat houses have to be at waters edge.
- Set backs and shore development are primary. This lake (Swan) although underdeveloped by guideline standards has a very busy weekend use which should be considered before more perimeter development, also water quality enters into this.
- It is my belief that more regulations wouldn't work as well as if an environmental preservation pamphlet was sent to schools, businesses and homes four times a year through the mail or handout basis (work within presently existing ministries).
- It took 2 years to complete this study, how do you expect the public to make a proper decision, during 1 meeting and 1 questionnaire.
- Restricting land use is good in certain areas/spruce lots on private land (aesthetics).
- Public awareness a priority.
- Need to better monitor and regulate on site septic systems. Make a decision on minimum requirements and make it so. Riparian buffer zones were handled in the LRMP. Development and lot densities are already controlled by government. If you do not want it developed, don't sell it.
- In order to limit our negative impacts on lakeshore.

**2. Increased Public Access to Lakeshore Areas:**

- For the size of Swan Lake, it seems to be adequate.
- They come, urinate in the pool and leave.
- I believe Swan has sufficient access, however the activity from these areas need control, i.e.. jet skis and water skiers operating from a boat launch.
- I believe that if all the public access areas were re-cleared and made usable and clean again there would be plenty of room for everyone. However I believe we do need a few more overnight camping areas as these are packed on long weekends.
- No changes should be made for existing land owners, any changes should be put into effect only when land is being purchased. It is not fair to ask present landowners to change anything that was not in effect when they purchased their land.
- Three parks already exist on Charlie Lake / no more public access is needed.
- Enough road allowance and access already provided.
- If the public want access to lakeshore areas go to a park or buy a lot.
- As pointed out in the development guidelines, this can be a contentious issue. Could these sites include opportunities for educating the general public about the 'nature' and value of the lake and responsible use?
- Depends on the lake, many already have plenty of public access ie. Charlie, Inga, Moberly.

**3. Voluntary Stewardship and Public Education Programs:**

- For new development only.
- Assistance from the Regional District staff in co-ordinating a Swan Lake residents group would be an asset in developing future plans for this lake.
- I think that starting programs like these are the only way we will obtain 100% of our goal and that this form of education and community involvement will accomplish this in a way that regulations never will.
- Education of lake clean-up and prevention is good, cleaning ice garbage near breakup.
- Education first, legislation last.
- People who buy or utilize lakeshore areas need to be informed of rules and requirements so as not to damage environment.
- Absolutely.
- Needed, in order to limit our negative impacts on lakes.

**4. Regulations for Agricultural Activities in Proximity to Lakeshore Areas:**

- The excess fertilizer coming into Swan Lake is and has been a problem.
- Good idea for industry and agricultural.
- This is absolutely essential - at present farm manure can be found throughout the lake (Swan) in the spring.
- I believe that there is enough of this in affect, and that more would effect in the loss of private property owners having the freedom to use their land for their own purposes.
- I do believe that existing right of ways to lake should be maintained so the general public have access to the lake...you may want to look at some access...they are being blocked off by neighbours on either side who think they control access to the lake.
- Golf Course, Stoddart Creek and residential fertilization.
- No feedlots on lake, could look at agricultural areas - Stoddart Creek.
- Runoff control and monitoring of water quality is very important here. Chemicals in feed and fertilizer can easily get into the water.
- Yes.
- Needed. In order to limit our negative impacts on lake.

**Figures 1 & 2** summarize the ratings pertaining to each of the eight issues in the questionnaire, which were indicated on the fourteen response forms received:

**Figure 1**

Issues:	“Very Important”	“Important”	“Somewhat Important”	“Not Important”
Protection of Water Quality	79%	21%		
Preservation of Riparian Areas	23%	62%	15%	
Preservation of Lakeshore Habitat	43%	21%	21%	15%
Protection & Preservation of ESAs	46%	15%	31%	8%

**Figure 2**

<b>Issues:</b>	<b>“Very Much Needed”</b>	<b>“Needed”</b>	<b>“Somewhat Needed”</b>	<b>“Not Needed”</b>
Lakeshore Development Regulations	14%	43%	21%	22%
Increased Public Access to Lakes		21%	36%	43%
Voluntary Stewardship Programs	36%	36%	28%	
Regulations for Agricultural Activities	43%	29%	21%	7%

### **Part 2: Summary of Technical Committee Meetings**

In March 1999, a Technical Committee was formed for the project consisting of representatives from the following provincial agencies:

BC Environment	Ministry of Forests
BC Parks	Peace Liard Health Unit
BC Oil and Gas Commission	Ministry of Transportation and Highways
BC Assets and Lands Corporation	Ministry of Agriculture and Food

Two meetings were held in 1999 on March 31<sup>st</sup> and October 27<sup>th</sup>, when the draft was reviewed and discussed in detail. Representatives from the Provincial Agricultural Land Commission were unable to attend the meetings, however, the Land Commission responded in writing on several occasions with their comments.

The following summarizes the minutes from the two Technical Committee meetings, the comments received from the Land Commission, and suggestions received from Bruce Carmichael, Impact Assessment Biologist for BC Environment in Prince George.

#### **A) Recommendations and Comments from Technical Committee Meetings:**

1. That development permit areas and requirements for restrictive covenants be adopted in future land use bylaws.
2. That the Regional District should consider coordinating and investing more resources in public education and Volunteer Lake Monitoring Programs, in conjunction with BC Environment and local conservation / community groups.
3. That a model development plan should be drafted which could help educate the public in ways that lake conservation development practices could be carried out in an environmentally sustainable fashion.
4. That greater setback distances for on-site septic systems may be appropriate depending on site-specific conditions; and further that enforcing greater setback areas would require that specific bylaws be written by the PRRD before the local Health Unit could enforce

them.

**B) Recommendations and Comments from Bruce Carmichael, Impact Assessment Biologist, BC Environment:**

1. A recommended minimum lot size along the lakeshore be included, perhaps in Section 8.1 of the General Development and Subdivision Guidelines.
2. “Grey-water management issues” should be included somewhere in the document.
3. A list of shoreline plant species that are common in the Peace Region, and effective in removing nutrients, be included as suggestions for “replanting”, perhaps in Section 8.3.2.
4. The PRRD should take a firm approach to regulate agricultural activities in proximity to lakeshore and stream-side riparian areas.

**C) Recommendations and Comments from the Agricultural Land Commission:**

1. That the recommendation for riparian areas to be preserved at least 15 metres wide from a stream, lake or watercourse is “excessive” and thus should be **deleted** from the text in **Section 10.3 (3) (a)**; and replaced with a recommendation that agricultural activities and development conform to the guidelines set out in the new *10 Point Action Plan On Agriculture And The Environment*. (Please see attached letter in Appendix for details)
2. “That any future development permit areas written into an official community plan relating to the regulation of agricultural activities exempt farmers in the ALR from requiring permits to agricultural infrastructure works, such as fencing, ditch maintenance, pump structures, agri-buildings and lakeshore access for stock watering, etc.”

**APPENDIX C - LIST OF GOVERNMENT AGENCIES****Provincial Level**

**Peace Liard Community Health Services Society:** All domestic on-site waste water disposal system installations must be approved under the Health Act, and setbacks from water bodies must be sufficient to prevent contamination. In the Peace River Regional District, on-site waste disposal systems are regulated by the Peace-Liard Community Health Services Society.

**Provincial Agricultural Land Commission:** All lakeshore land that is within the Agricultural Land Reserve (ALR) is subject to the provisions of the Agricultural Land Commission Act. All subdivision and development proposals on lands in the ALR must first receive approval from the Agricultural Land Commission.

**Ministry of Agriculture and Food:** Although this agency does not have direct regulatory control over agricultural and grazing activities adjacent to lakeshore lands, it does play an important advisory role in crop management and providing weed control for waterfowl nesting areas. Recently, a Grazing Enhancement Fund has been implemented by this Ministry to assist those who wish to better manage riparian areas on grazing areas on Crown lands.

**BC Assets and Land Corporation:** Pursuant to the Land Act, this agency regulates the construction of permanent docks and the licencing of foreshore leases on Crown lands.

**BC Environment:** Activities that impact fish and fish habitat are regulated by the Fisheries Branch pursuant to the Fisheries Act. Approvals for short term use, storage and diversion of water, including alterations and works in and around a lakeshore are regulated by the Water Management Branch pursuant to the Water Act. The Environmental Protection Branch monitors solid, liquid and gaseous waste discharges into water pursuant to the Waste Management Act.

**BC Forest Service:** The Ministry of Forests is responsible for regulating all harvesting activities on both private and Crown lands. Under the Forest Practices Code of British Columbia, there are guidelines for managing road construction and harvesting near wetlands, riparian areas and lakeshore lands. The BC Forest Service also manages and maintains recreation spots and camp sites near lakes throughout the Peace River Regional District.

**BC Oil and Gas Commission:** This agency is a branch of the Ministry of Energy and Mines. The BC Oil and Gas Commission uses the Forest Practices Code to administer development guidelines and regulate setbacks for oil and gas activities near lakes in the region.

**Ministry of Transportation and Highways:** Pursuant to the Land Titles Act, the Ministry of Transportation and Highways has final approving authority for all subdivision proposals in the Peace River Regional District. This agency is also responsible for issuing access permits for newly created lots and approving road construction plans.

**Ministry of Small Business, Tourism and Culture:** Pursuant to the Heritage Conservation Act, the Archeological Branch of British Columbia is responsible for protecting heritage and archeological sites in the province.

**Federal Level**

**Agriculture Canada:** The **Prairie Farm Rehabilitation Administration (PFRA)**, a branch of Agriculture Canada, is involved in assisting farmers, ranchers and other rural residents in the implementation of irrigation and water management projects. This agency also promotes sustainable agriculture practices near waterways, and assists farmers with resources for the preservation wildlife habitats, soil conservation and environmental analysis.

**Department of Fisheries and Oceans:** Pursuant to the Fisheries Act, this agency is active in the preservation and enhancement of salmon spawning and rearing habitat in rivers, streams and lakes.

**Environment Canada:** Some of the legislation administered by Environment Canada in relation to lakeshore development is found in the Canada Water Act. This legislation includes provisions for formal consultation and agreements with the provinces, while the Government Organization Act assigns the national leadership for water management to the Minister of the Environment.

**Transport Canada** and the **Canadian Coast Guard** assure that waters remain capable of providing boat passage under the Navigable Water Protection Act.

**APPENDIX D - INTEREST GROUPS**

**Duck Unlimited**

1925 South Ogilvie Street  
Prince George, B.C. V2N 1X2

**Charlie Lake Conservation Society**

Box 720, Charlie Lake, B.C. V0C 1H0

**Chetwynd Environmental Society**

Box 2049, Chetwynd, B.C. V0C 1J0

**Chetwynd District Rod & Gun Club**

Box 1504, Chetwynd, B.C. V0C 1J0

**Dawson Creek Sportsman's Club**

PO Box 277, Dawson Creek, B.C. V0C 2C0

**Hudson's Hope Rod & Gun Club**

Box 419, Hudson's Hope, B.C. V0C 1V0

**Moberly Lake Community Association** Box

122, Moberly Lake, B.C. V0C 1X0

**Northern B.C. Guide Outfitters**

Box 6370, Fort St. John B.C. V1J 4K5

**Northern Environmental Action Team**

Box 6355, Fort St. John, B.C. V1J 4H6

**North Peace Cattleman's Committee**

**North Peace Rod & Gun Club**

Box 6435, Fort St. John, B.C. V1J 4H8

**One Island Lake Rate Payers Society**

Suite 201A, 10312 12<sup>th</sup> St.

Dawson Creek, B.C. V1G 4S9

**South Peace Livestock Association**

**Saulteau First Nations**

Box 414, Chetwynd, B.C. V0C 1J0

**West Moberly Lake First Nations**

Box 90, Moberly Lake, B.C. V0C 1X0



## **APPENDIX E - LAKE CLASSIFICATION CRITERIA**

The main criteria used in these guidelines to classify each lake are as follows:

- lake size,
- perimeter development,
- existing land use information,
- Canadian Land Inventory (CLI) capability ratings,
- fish value data (when available), and
- water quality data (when available).

### **Lake Size:**

The area of a lake is one factor that can be used to help determine either its ability or disability to accommodate future development activities. According to a technical report within the 1994 Lakeshore Guidelines of the Fraser Fort George Regional District, lakes are categorized as either small lakes, middle size lakes or large lakes, with each size having a unique effect on the ecological evolution of a lake and “its usefulness for human activities”.

The criteria used for these guidelines similarly uses lake size as a major factor for classifying lakes. The relatively larger lakes are generally able to accommodate more development than the medium and smaller sized lakes. The direct relationship between a lake’s size and its ability or disability to accommodate future development is explained below:

- Small lakes** have surface areas less than 60 hectares with short wind fetches and little surface area relative to the shoreline. A short wind fetch results in limited wave action, which, in turn, prevents the sorting of littoral sediments allowing for a build-up of residues on a small lake’s bottom. Provided that the water quality is adequate, aquatic plants and marsh-like vegetation will eventually encompass the shoreline using the build-up of sediments as an anchor. Development on small lakes is not recommended because the shore zone is usually not adequate for construction.
- Medium sized lakes** have surface areas greater than or equal to 60 hectares. These lakes are generally large enough for wind action to produce waves that can achieve the sorting of sediments on windward shores, thus preventing the establishment of vegetation in the littoral zone (the shallow area less than 6 metres in depth around a lakeshore). These lakes usually have well-sorted sandy or gravelly windward shores that may be suited for some development and recreation activities.
- Large lakes** have surface areas over 260 hectares with sufficient wind action from all directions, which enables the sorting of sediments on all shores except in protected bays. A large extent of the shore zone areas on these lakes is stable enough to accommodate various forms of development.

The number of lakes identified in these guidelines that are over 800 hectares is limited. Due to their size, physical characteristics, existing development patterns and infrastructure, larger lakes can accommodate relatively higher levels of development activity and a broader range of mix uses than the smaller and medium sized lakes. However, as will be explained in the following

sections, lake size alone is not always the determining factor for the level of potential development.

### **Perimeter Development:**

Within this document, the term “development” refers to all works and activities that modify the land for human use. These works and activities include the construction, additions, alterations and clearing of land for buildings; the clearing of land for road access and parking lot construction; the clearing of land for the development of parks and recreation sites; and any type of commercial, industrial, agricultural or forestry activity.

In order to balance development pressures along a lakeshore with the need to preserve riparian habitat, the main objective is to not have the perimeter of a lake developed beyond a specified percent of the lake’s total perimeter. The benchmarks set for maximum perimeter shoreline development for each lake classification are primarily dependant on a lake’s surface area.

The method of analysis used to determine each lake’s perimeter development involved measuring the lake frontage of each individual parcel located along a lakeshore. Then, using the measurement criteria in the table below, the sum of all parcels on a specific lake was divided into that lake’s perimeter to determine the percentage of perimeter development. This measurement criteria was used in the 1994 Lakeshore Guidelines of the Fraser Fort George Regional District, and is based on varying parcel sizes of different land use categories, intensity of development patterns associated with each land use category, and the potential for development in each land use category.

### **Perimeter Development Measurement Criteria:**

<b>Size and Type of Land Use</b>	<b>Measurement Criteria</b>
residential lots less than 2 ha	the frontage of each lot is measured whether occupied or vacant
private parcels 2 ha or greater but less than 16 ha including residential, agricultural or forestry land uses	calculate as developed, 90 m for each parcel whether vacant or occupied, or the actual shoreline, whichever is less
private parcels 16 ha and over	calculate 90 m per parcel
commercial or recreational-commercial use; utility, roads, or industrial use; or common (public use) areas	measure the actual shoreline of the site and count as development
provincial or regional district parks and campsites	measure the actual developed shoreline
Crown land parcels, govt. reserves, First Nations reserves, Ducks Unlimited sites	measure 10% of actual developed shoreline to maximum of 100 m

**Canadian Land Inventory (CLI) Data:**

The CLI capability ratings for waterfowl, ungulates, forestry, recreation and agriculture were each considered in the lake classification analysis for these guidelines. For each of the five lake classifications in Sections 10 to 14, the criteria for CLI capability ratings are noted. The following table summarizes the CLI ratings for each attribute:

<b>CLI Rating</b>	<b>Waterfowl</b>	<b>Ungulates</b>	<b>Forestry</b>	<b>Recreation</b>	<b>Agriculture</b>
1	no significant limitations to the production of waterfowl	no significant limitations to the production of ungulates	no limitations growth of commercial forests	very high capability for outdoor recreation	no significant limitations in use for crops
2	very slight limitations	very slight limitations	slight limitations	high capability	moderate limitations
3	slight limitations	slight limitations	moderate limitations	moderately high capability	moderately severe limitations

*Please note that Canadian Land Inventory data used in the lake classification analysis was compiled by federal and provincial government agencies prior to 1972 for small scale mapping purposes (1:125 000); thus the above information is generalized and may not accurately represent current conditions in site-specific locations.*

**APPENDIX F - BIBLIOGRAPHY**

- Arendt, R. (1996) *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks*. Island Press. Spring.
- British Columbia Provincial Government. (1997) *Fort St. John Land and Resource Management Plan*. April.
- Brooks, K. (1982) *Lake And Waterway Policies, Peace-Liard Regional District*. Dawson Creek, British Columbia, November.
- Carmichael B. and T. French. (1999) *Limnological Aspects of Charlie Lake (Peace River Drainage, British Columbia): A Summary of Data Collected Between 1974 and 1995*. Ministry of Environment Lands and Parks and Salix Environmental Services, Prince George, British Columbia, December.
- Carmichael et. al. (1998) "The Importance of Bednesti Lake and its Watershed." *BC Lake Volunteer Lake Monitoring Program*. Ministry of Environment, Lands and Parks and The British Columbia Lake Stewardship Society.
- Environment Canada. (1997) *Freshwater Website*. URL:[http://www.ec.gc.ca/water/e\\_main.html](http://www.ec.gc.ca/water/e_main.html).
- Environment Canada. (1992) "Wetland Evaluation Guide." *Sustaining Wetlands*. Volume 1. Ottawa, Ontario, March.
- Fisheries and Oceans Canada and BC Environment. (1997) "Access Near Aquatic Area: A Guide to Sensitive Planning, Design and Management". *The Stewardship Series*.
- Fisheries and Oceans Canada and BC Environment. (1996) "Community Greenways: Linking Communities to Country, and People to Nature." *The Stewardship Series*.
- Fisheries and Oceans Canada and BC Environment. (1997) "Stewardship Bylaws: A Guide for Local Government." *The Stewardship Series*.
- Fisheries and Oceans Canada and BC Environment. (1994) "Stream Stewardship: A Guide for Planners and Developers." *The Stewardship Series*.
- Fisheries and Oceans Canada and BC Environment. (1997) "Watershed Stewardship: A Guide for Agriculture." *The Stewardship Series*.
- Fisheries and Oceans Canada and British Columbia Ministry of Environment, Lands and Parks. (1992) *Land Development Guidelines for the Protection of Aquatic Habitat*. Victoria, British Columbia, May.
- Fraser-Fort George Regional District. (1994) *Lakeshore Guidelines*. Prince George, British Columbia, April.
- Habitat Conservation Fund and BC Environment. (No Date) *Lake Care: A property owner's guide to conserving fish habitat in lakes* (brochure).

- Ministry of Environment, Lands and Parks and Ministry of Forests. (1994) *Assessment and Prescriptions for Watershed Restoration*. Watershed Restoration Circulars No. 1 to 8. British Columbia, July.
- Ministry of Forests. (1996) *Lake Classification and Lakeshore Management Guidebook: Prince George Forest Region*. British Columbia, September.
- Moss, B. (1998) "Shallow Lakes Bio-manipulation and Eutrophication", *Scope Newsletter*. University of Liverpool, Vol. 29, October.
- Moss, G. (1993) "Sources and Types of Water Pollution", *Environmental Views*, September & October.
- North Peace Adult Education Council. (1998) *Community Profiles: Peace River and Fort Nelson- Liard Regions*. Fort St. John, British Columbia.
- Osmond, D.L., D.E. Line, J.A. Gale, R.W. Gannon, C.B. Knott, K.A. Bartenhagen, M.H. Turner, S.W. Coffey, J. Spooner, J. Wells, J.C. Walker, L.L. Hargrove, M.A. Foster, P.D. Robillard, and D.W. Lehning. (1995) *WATERSHEDSS: Water, Soil and Hydro-Environmental Decision Support System.*, <http://h2osparc.wq.ncsu.edu>.
- Stewart, C. (1998) "Down By the Riverside - Protecting Riparian Lands". *LoGo NoteBook*. Staples McDannold Stewart Barristers & Solicitors. Victoria, British Columbia
- Thompson-Nicola Regional District. (1991) *Lakes Study Policy Statement*. Kamloops, British Columbia, October.