1. INTRODUCTION

This ecosystem-based landscape plan for the Slocan River watershed in British Columbia, Canada represents a fundamentally different approach to looking at and planning human activities in ecosystems. The basic premise of an ecosystem-based approach is that human societies and economies depend on a healthy ecosystem. Therefore, an ecosystem-based approach starts with the question: What do we need to protect and maintain in order to ensure short- and long-term ecosystem functioning? Once this question has been answered, then we ask: What kinds of human activities will lead to a stable, diverse, community-based economy that respects ecological limits?

An ecosystem-based approach also looks first at the landscape level, or the "big picture," because the integrity of small forest areas depends upon protecting the pattern of and connections between the small forest areas that make up the larger landscape. The cumulative effects of human disturbances can also best be seen and evaluated at the landscape scale. As well, the habitat requirements of many large animals must be looked at across large areas. Once the ecosystem-based approach has been used over the larger landscape to define the ecological limits to human activities and areas that need to be protected in order to maintain biodiversity, then the same approach must be applied to the planning of ecologically responsible human uses for areas where these uses are appropriate. For example, in order to plan and carry out ecologically responsible timber extraction, the same sequence of steps must be followed for the forest stand: ecological limits must be further defined and connections throughout the stand must be maintained.

This report and the maps that accompany it form the landscape level plan for the Slocan River watershed. We have identified the ecological limits to human activities, a protected landscape network to protect ecosystem functioning and to maintain biodiversity, and zones where various ecologically responsible human activities are taking or might take place. The next step in the process is to apply the ecosystem-based approach to the planning of each human activity by further defining ecological limits and protected landscape networks at a scale appropriate to the size of the small area (i.e. forest stand) being planned.

In contrast to an ecosystem-based approach, conventional approaches to land use start with the question: Where are the best resources and how can we access them? In conventional approaches, protection of ecosystem functioning is secondary to resource exploitation, and managers assume that any hazards can be mitigated. Conventional approaches to timber management have resulted in soil degradation, landslides, significant reduction in the amount of mature and old growth forest, destruction of wildlife habitat, destruction of areas important to Indigenous cultures, and compromise to other forest uses such as tourism, recreation, wildcrafting. An ecosystem-based approach seeks to accommodate the needs of a variety of forest uses, including resource extraction, while protecting, maintaining, or restoring (where necessary) the integrity of the ecosystem.

An ecosystem-based landscape plan also differs from the land use planning exercises currently taking place within British Columbia. During a land use planning process, various interest groups divide up the landscape for a variety of human uses. Land use planning tends to focus on what humans want to take from the land. In contrast, an ecosystem-based landscape planning process starts by defining what needs to be protected in order to maintain short- and long-term ecosystem functioning, then establishes human uses within those ecological limits. Ecosystem-based planning focuses first on what to leave, then on what to take.

Directors and staff of the Silva Forest Foundation began developing the ideas around an ecosystem-based approach to landscape planning more than fifteen years ago. Ideas and methodologies were enriched and supported by leading-edge researchers in the fields of forest ecology, landscape ecology, conservation biology, and ecological economics. The ecosystem-based landscape plan for the Slocan River watershed represents the first attempt to apply the methodology and analysis to a landscape as large as the 340,000 hectare Slocan River watershed. It is also the first attempt to try to propose a community-based economy that builds on the diversity of the natural landscape, and the strengths and diversity of the existing economy. Because this project was charting new ground, much has been learned and developed that will streamline future ecosystem-based landscape plans.

While we have attempted to be consistent in our use of terminology, there may be instances where different terms have been used to mean the same thing or where there may be some confusion regarding the meaning of terms. Some important examples are:

- The terms Slocan River watershed, Slocan Valley, Slocan Valley drainage basin, and Slocan River landscape are used interchangeably.
- The maps accompanying this report refer to Wholistic Forest Use Zones, while the report refers to Ecologically Responsible Forest Use Zones. These two terms are interchangeable.
- Ecologically responsible forest use means that all human uses must first respect ecological limits. Ecologically responsible forest uses are part of an ecosystem-based approach that defines ecological limits and identifies where human uses can take place.

This report, *An Ecosystem-based Landscape Plan for the Slocan River Watershed, British Columbia, Canada*, consists of eight sections, with this introduction as the first:

> **Section 2 - An Ecosystem-Based Approach to Forest Protection and Use: Definition and Scientific Rationale -** describes the philosophy and the principles that guide an ecosystem-based approach. This section also provides references from the scientific literature that support an ecosystem-based approach.
>
> **Section 3 - Slocan River Watershed: An Ecological Description -** describes the terrain, climate, and other features of the ecology of the study area.

Section 4 - Methodology and Decisions on Important Issues: A Summary - defines the data, interpretations, and assumptions that form the basis for this ecosystem-based landscape plan.

Section 5 - Results: Landscape Analysis, Protected Landscape Network, and Zoning - summarizes key findings of each of these parts of the plan.

Section 6 - The Emerging and Proposed Economy - looks at how the current economy is changing from its former dependence on resource extraction industries, and how the current economy is diversifying and depends on maintaining the high quality of the natural environment. This section proposes an ecosystem-based economy that protects ecosystem functioning and meets human needs.

Section 7 - Transition Strategy: Getting from Today's Economy to an Ecosystem-based Economy - describes some paths the community can pursue to strengthen the parts of the economy that are ecosystem-based. For non-sustainable parts of the current economy, practical ways are proposed to move towards an ecosystem-based economy.

Section 8 - Conclusions and Recommendations: Where to Go from Here - provides suggestions about the next steps to be taken in order to implement ecologically responsible human uses in the Slocan Valley.

A set of appendices follows the body of the report and provides additional information about various topics within the report, sample maps at a reduced scale, and detailed tables describing the results summarized in Section 5.

The extensive mapping produced during this study forms the backbone of this report and is critical to the understanding of the information presented in the report. Computer geographic information systems (GIS) were used to compile and analyze the mapping information. The Slocan River watershed is a landscape of approximately 340,000 hectares. In order to perform the analysis at a reasonable scale, the Slocan River watershed was divided into eight landscape units with boundaries defined, as much as possible, along natural watershed boundaries. For each landscape unit, a set of six maps was prepared at a scale of 1:50,000. All landscape units were then combined to create a composite map of the entire Slocan River watershed and the same six maps were created for the entire area at a scale of 1:125,000. The six maps are:

- ***Landbase Unsuitable for Development*** (clear overlay): *Interpretation*: Shows areas that the Ministry of Forests considers unsuitable for timber management, and additional areas that SFF determined to have ecological limits to timber management and other resource extraction activities.
- ***Logged and Old-Growth Areas:*** *Interpretation:* Shows the location of ecologically sensitive and stable/moderately stable old growth forests in relationship to past logging.
- ***Protected Landscape Network:*** *Interpretation:* Shows the interconnected network of ecosystems (riparian ecosystems, old growth forests, ecologically sensitive areas,

and cross valley corridors) which must be protected to maintain ecosystem functioning at the landscape level.

- ***Wholistic Forest Use Zones*** (clear overlay)***:*** *Interpretation:* Shows forest use zones (large protected areas, consumptive use watersheds, headwaters protection, commercial tourism, restoration, wholistic timber). Zones provide for balanced use of the landscape. Wholistic (ecologically responsible) forest use zones ensure that human uses do not degrade ecosystem functioning.
- ***Siniixt Cultural Areas:*** *Interpretation:* Shows areas of identified spiritual use, high cultural use, moderate cultural use. Protection of Siniixt cultural areas requires meaningful consultation with the Siniixt Nation.
- ***Existing and Planned Logging*** (clear overlay)***:*** *Interpretation:* Shows the locations of existing and planned roads and logging.
- ***Additional map, Composite Map Set: Geographic References*** (clear overlay)***:*** *Interpretation:* Shows the eight landscape analysis units, drainage basins, provincial parks, roads (main and secondary), villages, major mountain peaks, and a map index for the Ministry of Forests forest cover maps that formed the foundation for GIS interpretations.

The interpretive maps for this project are large and expensive to reproduce. However, **Appendix 6 contains small-scale examples of the 1:50,000 interpretive map sets for two of the eight landscape analysis units.**

The ecosystem-based maps and this report for the Slocan River watershed provide critical information about the current state of the area's forests, about the ecological limits to human activities, about what areas to protect in order to maintain biodiversity and overall forest functioning, about ecologically responsible human use zones, and about how a diverse, stable economy can be developed and maintained within ecological limits.