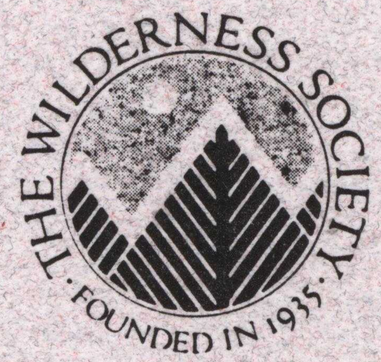
# ANCIENT RAINFORESTS AT RISK

## An Interim Report by the Vancouver Island Mapping Project




December 16, 1991

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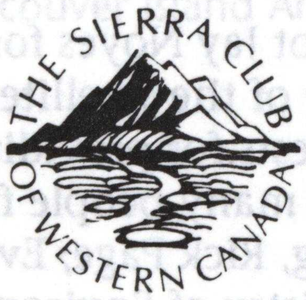


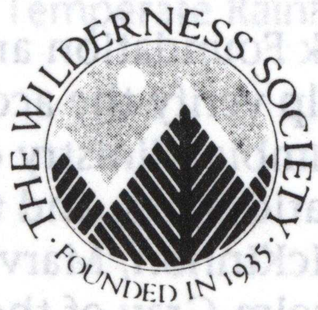


December 16, 1991

ACKNOWLEDGEMENTS

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Environmental Systems Research Institute (ESRI) and ERDAS assisted the project greatly through the donation of GIS and remote sensing software. Charles Convis of ESRI provided help with the conversion of several GIS layers. Sun Microsystems provided invaluable assistance through their donation of workstation and networking technology. IMAGRAPH Corp. helped to provide a 32-bit image display board.

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# PREFACE

This interim report presents preliminary results from a study of the historic and current conditions of the ancient temperate rainforests of Vancouver Island. The Vancouver Island Mapping Project is an international initiative co-ordinated by Vicky Husband, Chair of the Sierra Club of Western Canada, and ecologist Peter Morrison of the Wilderness Society, director of the ancient forest mapping team.

This study provides the most up to date inventory of Vancouver Island's ancient forests since the British Columbia Ministry of Forests divided the Island into a series of Tree Farm Licences and Timber Supply Areas in the mid-1950s. In this interim report we examine and compare the condition of the forests in 1954 and 1990. We include a set of inventory maps produced through a state-of-the-art geographic information system (GIS) using data from 1990 satellite imagery and from the Research Branch of the Ministry of Forests.

The work of generating the information was done by the ancient forest mapping project of The Wilderness Society. Remote sensing specialist David Leversee was responsible for satellite image processing, GIS analysis and the production of forest condition maps. He was assisted by GIS analysts Caroline Socha and Gavin Gray, GIS co-ordinator Susan Balikov, and program director Peter Morrison. Sharon Chow of the Sierra Club provided invaluable assistance and advice throughout the course of the project. Victoria forestry consultant Ray Travers played an important role in verifying and analyzing the data. The interim report was written by Cameron Young and designed and produced by Frances Hunter.

A more detailed, final report will be released early in 1992. It will include additional maps depicting the original state of Vancouver Island's forests, and the condition of the forests in 1972. It will describe the historic and current distribution of ancient forests on Vancouver Island by ecological zone and elevation. The final report will also locate low elevation forests, examine the rate of logging, and analyze the progressive fragmentation of the landscape caused by clearcutting and road building. Finally, the report will identify ecologically important ancient forests and provide recommendations for a conservation strategy for the remaining ancient temperate rainforests of Vancouver Island.

The Vancouver Island Mapping Project was made possible through generous grants provided by the Stone Foundation, the Lazar Foundation, and the Bullitt Foundation.

Vicky Husband
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# I. SUMMARY

Vancouver Island is approximately 3.2 million hectares in size. The purpose of the Vancouver Island Mapping Project is to determine how much ancient temperate rainforest still exists on the Island.

Using data from satellite images, historical records, and biogeoclimatic maps, project staff concluded that in 1990, Vancouver Island contained 829,000 hectares of ancient temperate rainforest.

How does this compare to earlier years? To find out, the staff developed a pair of maps that compared the forest cover in 1990 with that in 1954. The 1954 map was based on a forest inventory of Vancouver Island carried out by the Ministry of Forests.

In 1954 Vancouver Island contained approximately 1.69 million hectares of ancient forest — more than twice the area of ancient forest remaining on Vancouver Island today.

In other words, about half the ancient forest that existed on Vancouver Island in 1954 has been liquidated. Every year, on average, for the past 36 years, the forest industry has logged close to 24,000 hectares of rainforest — an area roughly equal in size to Pacific Rim National Park.

This logging generally has taken place on productive, low-elevation sites. The intact forests that remain today typically are less commercially valuable and are located on less accessible steep slopes and in areas with heavy rainfalls and high winds.

If logging continues to occur on Vancouver Island at historical levels, the Island's entire unprotected forest landscape will be completely denuded of its ancient temperate rainforest by the year 2022. Effectively, the end of the ancient rainforest will occur much earlier, when the last of the remaining intact watersheds are opened to development.

The most heavily logged region of Vancouver Island is the South Island, and the project staff prepared a South Island case study covering all ancient forests occurring south of the Alberni Canal. The results show that only 25 percent of the South Island ancient temperate rainforest that existed in 1954 still remains today. Given the average annual rate of forest clearance on the South Island since 1954 (8300 hectares), all remaining unprotected, ancient temperate rainforests on the South Island will be liquidated by the year 2001.

The consequences of liquidating the best quality timber of Vancouver Island are evident today in two fundamental ways:

1. A serious decline in the Vancouver Island forest industry, especially on the South Island, resulting in severe economic hardships and social dislocation in forestry-dependent local communities.

2. The systematic undermining of the ancient forest ecosystems where vast clearcuts and simplified, man-made treescapes replace more biologically diverse ecosystems. This environmental degradation reduces fish and wildlife habitat and compromise alternative resource-use options such as commercial and recreational fishing and wilderness tourism.

NOTE: The projections by this report that all ancient temperate rainforests on Vancouver Island will be liquidated by the year 2022, and on the South Island by the year 2001, are based on annual average rates of forest loss over the past 36 years. However, most logging on Vancouver Island takes places within various forest management units (TFLs and TSAs). The rates of logging within any one management unit will not necessarily coincide with the Island-wide average. Some management units may liquidate all their ancient temperate rainforest long before the years 2022 or 2001. Other management units may follow a logging timetable that takes them beyond those time periods. For all practical purposes, however, the preliminary data clearly shows that unless there is a significant change in the overall rate of logging on Vancouver Island, the Island's ancient temperate rainforest will be liquidated within the time frames projected.

Unless there is a major change in forest policy, the economy and the environment of Vancouver Island will continue to deteriorate. What is urgently required is an ancient forest conservation program for Vancouver Island dedicated to sustaining the economy and the environment of the Island over the long term. The alternative is to stand by and watch the rest of Vancouver Island's rare and remarkable rainforests — and the promise for the future they represent — continue to be squandered for short-term gain.

## HIGHLIGHTS

1. By 1990 more than half the ancient temperate rainforest that existed on Vancouver Island in 1954 had been liquidated.

2. Every year on average since 1954, the forest industry on Vancouver Island has logged an area of rainforest roughly equal in size to Pacific Rim National Park.

3. At that rate of logging, (approximately 24,000 hectares) all unprotected ancient forests on Vancouver Island will be liquidated by 2022.

4. Most of the low elevation, high quality forests (and equally high quality fish and wildlife habitat) already have been logged. Most of the remaining forests are highly fragmented and are located on less accessible steep and windy mountain slopes.

5. Approximately 25 percent of the South Island ancient temperate rainforest that existed in 1954 remains intact today. Virtually all remaining unprotected ancient forests on the South Island will be liquidated by the year 2001.

# II. INTRODUCTION

## A Vanishing Heritage

After more than a century of logging, the ancient forests of North America have virtually disappeared from most of the Pacific Coast. When the Wilderness Society recently conducted comprehensive studies of ancient forests in northern California, Oregon and Washington, they discovered that only 1.9 million hectares of these great forests still remain. Of this amount, approximately 590,000 hectares are protected in wilderness areas, natural parks and research natural areas.

Unprotected ancient forests are highly fragmented, the result of heavy logging and dispersion of clearcuts and roads across the landscape. Fragmentation has caused a deterioration of the remaining ancient forest ecosystems, and wildlife species such as the spotted owl are severely threatened. Only a few blocks of unfragmented ancient forests greater than 5,000 hectares in size still exist intact south of the British Columbia border.

Ancient temperate rainforests in British Columbia generally have fared better, especially on the north coast where 66 out of a total of 180 primary watersheds larger than 5,000 hectares in size are still undeveloped. However, these watersheds are located in extremely mountainous regions where the prime rainforests are restricted to narrow river valleys.

The picture in southern British Columbia is quite different. Here the rainforests are more accessible, more productive, and more in demand by the timber industry. Of the 174 primary watersheds in southern British Columbia larger than 5,000 hectares in size, only six remain completely undeveloped today. One of these is in Knight Inlet on the rugged mainland coast. The other five are located on the west side of Vancouver Island. In fact, most remaining rainforest of any significance in southern British Columbia is found in three regions on the west side of Vancouver Island: Brooks/Kyuquot region, Clayoquot Sound, and the Carmanah/Walbran watersheds.

These three spectacular and biologically diverse rainforests contain an intricate network of streams, lakes and estuaries that provide a home for a wealth of wild animals, including numerous species of birds and marine life. The intertidal regions where the land meets the sea are among the most biologically rich in the world. Up to five species of salmon swim from the Pacific into the rainforest rivers and streams to spawn. This dramatic wilderness setting combines snow-capped mountains, meandering rivers, massive rainforests, wind-swept beaches and remote off-shore islands.

The west coast of Vancouver Island is one of the few places in North America where substantial portions of the land and sea environments still remain virtually intact. Indeed, the wilderness rainforest watersheds of Vancouver Island are in a class by themselves, aesthetically as well as ecologically.

## Time For Action

The Sierra Club of Western Canada is committed to developing a temperate rainforest conservation strategy for Vancouver Island and coastal British Columbia. As a first step we are documenting the extent of logging on Vancouver Island to provide the basic information required to make informed decisions on issues such as protecting the biological diversity of the rainforest ecosystems and conserving rainforest wilderness.

The fundamental questions are these: How much ancient temperate rainforest is left on Vancouver Island? How much has been logged? How much will remain by the year 2001? Or the year 2020?

For more than a decade the Sierra Club has sought responses to these questions from government and industry, but to no avail. Finally in 1991 the Sierra Club joined forces with The Wilderness Society, whose Seattle-based ancient forest mapping team has carried out detailed studies of ancient forests in the Pacific Northwest. Together they undertook to develop a comprehensive profile of the ancient temperate rainforests of Vancouver Island. The Sierra Club of Western Canada provided most of the funding for the project, and The Wilderness Society

contributed staff time, facilities, and their considerable experience and expertise in forest mapping.

Using satellite imagery and digitized data in a geographic information system (GIS), the mapping team developed a series of maps depicting the current forest inventory of Vancouver Island. By referring to a forest inventory of Vancouver Island conducted by the Ministry of Forests in 1954, the mapping team could compare the state of the forest in 1990 with what it was in 1954.

The preliminary results contained in this interim report are startling. The irreplaceable ancient temperate rainforests of Vancouver Island cover only half as much of the Island as they did in 1954. If logging continues at historical levels, all unprotected ancient temperate rainforest on southern Vancouver Island will be entirely liquidated by the year 2001. The rest of Vancouver Island's unprotected rainforest will disappear by the year 2022.

This systematic dismantling of the ancient forests cannot be allowed to run its course.

# III. TEMPERATE RAINFOREST: A UNIQUE ECOSYSTEM

Temperate rainforests are rare in the world, covering only about 0.2 percent of the earth's land area. They commonly grow in the presence of mountains next to an ocean, and they receive an average of 2,000 millimetres (80 inches) of rain annually.

Although temperate rainforests are found in parts of Chile, Tasmania, New Zealand and Norway, approximately one half of all the world's temperate rainforests grow along the west coast of Canada and the United States from Alaska to Oregon.

The Olympic Peninsula and Vancouver Island is where this rainforest takes on its most luxuriant expression. Here old-growth trees grow extremely big and old, producing more forest biomass than nearly any other forest on earth — including tropical rainforests.

In British Columbia, the term "temperate rainforest" is not officially recognized in forestry circles. The Ministry of Forests classifies the province's forests according to biogeoclimatic zones. The rain-drenched, low and middle elevation coastal forests stretching from Vancouver Island to Alaska form the Coastal Western Hemlock Zone. Mean annual precipitation for this zone is 2228 mm, and ranges from 1000 to at least 4400 mm. For the purposes of this report, the Coastal Western Hemlock Zone represents the ancient temperate rainforest of British Columbia.

The ancient forests of Vancouver Island slowly evolved upon the landscape following the passing of the last ice age approximately 11,000 years ago. The build-up of organic material on the forest floor created the first coastal bogs some 5,000 years ago. At the same time, the coastal forests as we know them began to take shape. The most majestic trees of the rainforest typically grew in the valleys of the coastal rivers.

## So Rare, So Big, So Old

The main tree species of the ancient temperate rainforest in British Columbia are western hemlock (50 percent of remaining mature forest), western redcedar and amabilis fir. Douglas-fir and Sitka spruce together account for about ten percent of the remaining ancient forest. Four species are unique to the Pacific Northwest, occurring naturally nowhere else in the world.

The dominant trees in the temperate rainforest commonly survive for 300 to 800 years; some veterans are thought to approach 2000 years. Over time they develop into some of the world's tallest (95 metres) and most massive trees. Vancouver Island is where they do some of their best growing of all. Record-sized specimens of the major tree species are found throughout the west coast of the Island.

Today, stands of ancient temperate rainforest on Vancouver Island can still average more than 1100 tonnes of living biomass per hectare. This is by far the most biologically productive region in Canada, and one of the best tree growing regions in the world.

## Other Ancient Forests

Not all of Vancouver Island contains ancient temperate rainforests. A narrow strip on the east side of the Island, which was once blanketed in towering Douglas-firs, does not receive enough rain to qualify as a true rainforest. These ancient Douglas-fir forests have long been favoured by the forest industry and today only tiny fragments of this drier forest ecosystem still remain. However, individual old-growth Douglas-fir trees can still be found scattered throughout the ancient temperate rainforest.

Bogs and bog forests are common along the wet outer coasts. These intricate ecosystems are highly acidic and contain little dissolved oxygen. Trees, if they can grow here at all, are stunted and contorted. Other marginal forests occur on poor growing sites across the Island, especially on steep slopes and low-lying coastal areas.

The higher elevation, sub-alpine forests of Vancouver Island are dominated by mountain hemlock. These slow-growing, ancient "snow forests" are quite different in composition from the lower elevation, ancient temperate rainforests. Very little logging has occurred in the mountain hemlock zone.

In mapping the ancient temperate rainforests of Vancouver Island, bog ecosystems, marginal forests and the sub-alpine mountain hemlock zone were put into separate categories. What fragments remain of the Douglas-fir zone were included with the temperate rainforest.

# IV. THE VANCOUVER ISLAND MAPPING PROJECT

## Land Allocation

More than 80 percent of Vancouver Island is allocated to logging. Many of these allocations occurred in the mid-1950s, when the province of British Columbia assigned most of the Island's Crown forest lands to a handful of forest companies in the form of Tree Farm Licences (TFL). A percentage of each TFL also included private forest lands held by the respective companies. The remaining public forests were placed into Timber Supply Areas (TSA) managed directly by the Ministry of Forests.

Companies holding TFLs manage these forest tenures much as they do their privately owned forests; TFLS are still bought and sold on the open market. TFL holders maintain control over all forest inventories, and until very recently the Ministry of Forests was not provided with TFL inventory information.

By far the largest forest operator on Vancouver Island is MacMillan Bloedel, with combined public and private forest holdings that cover about 31 percent of the Island (approximately 997,000 hectares). The other Vancouver Island TFL holders are Fletcher Challenge, Canadian Pacific Forest Products, Canfor, and Western Forest Products.

The Ministry of Forests directly oversees a full 20 percent of the Island landscape through its TSAs. However, less than half of this land actually contains commercially productive forests. The Ministry allocates timber quotas from TSAs to some of the same companies that already hold TFLs. Other forest companies such as Interfor also receive sizable timber quotas from the TSAs.

Approximately nine percent of Vancouver Island is protected in parks and reserves. However, since these park landscapes consist largely of bog, subalpine forests, alpine vegetation, rock and ice, the areas of true ancient temperate rainforest protected in the parks and reserves cover approximately three percent of the Island.

## Developing The Maps

Over the past three years The Wilderness Society developed a remote sensing geographical information system (GIS) laboratory to map the forest condition of the twelve national forests in Washington, Oregon and Northern California. This same laboratory and expertise was applied to the Vancouver Island Mapping Project.

The mapping team used Landsat digital satellite imagery to determine the forest cover on Vancouver Island. Five separate images were needed to cover the entire Island. Each image had to be processed and classified individually, then assembled together to produce the final map.

The first stage of the project involved analyzing the Landsat data to determine the various types of ground cover on the Island (water, snow, shrubs, plantations, bog forests, coniferous forests, etc). There are limitations to this process, however, and data from other sources was used to build up the information base. One important data source was the Interim Forest Cover maps produced by the Ministry of Forests, which used information from 1954 aerial photographs.

To develop the 1954 map, the mapping team combined information from the 1990 map with the Interim Forest Cover data to recreate a map of all forest types occurring on Vancouver Island in 1954. The 1990 satellite data helped fill in some of the gaps missing from the 1954 data.

A more detailed methodology of the process used to create both the 1990 and 1954 maps is available on request.

## Results

The data for the Vancouver Island Mapping Project was developed over an eight-month period. Ultimately the mapping team produced a computer-generated map showing the extent of the ancient temperate rainforest of Vancouver Island in 1954 and in 1990.

In 1954 Vancouver Island contained 1.685 million hectares of ancient temperate rainforest. In 1990 that amount had dwindled to 829,000 hectares — a loss of more than 50 percent.

The study also showed that the five major parks on Vancouver Island cover 174,000 hectares of forest, water, rock and ice; only 75,000 hectares contain true ancient temperate rainforests.

The average annual rate of forest liquidation since 1954 has been approximately 23,800 hectares a year — an area of land roughly equal in size to the entire area of Pacific Rim National Park. Given that rate of forest clearance, all unprotected ancient temperate rainforest on Vancouver Island will be liquidated by the year 2022.

***Low Elevation Logging***: Much of the logging since 1954 occurred on the best forest sites — low elevation and valley bottom forests. These sites typically grow high quality Sitka spruce, Douglas-fir, western redcedar and western hemlock. They also provide important habitat for a wide variety of fish and wildlife. Clearcut logging of these regions greatly reduces the broad spectrum of natural ecological processes that created these biologically rich areas.

***Fragmentation***: One of the most noticeable changes that has occurred on Vancouver Island since 1954 is fragmentation of the forest landscape. Where huge tracts of forest once spread undisturbed across vast areas of the Island, today those forests have been reduced to a string of clearcuts linked by logging roads.

***Reduced Forest Quality***: On the whole, the remaining temperate rainforest of Vancouver Island is of a poorer quality than much of the rainforest that existed in 1954. The ancient forests remaining today typically grow on unstable, inaccessible, steep mountain slopes where both rainfall and wind can be excessive.

**REMAINING ANCIENT FORESTS (Preliminary Figures)**

| | |
|---|---|
| Total Area of Vancouver Island | 3.20 million hectares |
| Ancient Forest in 1954 | 1.69 million hectares |
| Ancient Forest in 1990 | 829,000 hectares |
| Total Area Logged | 861,000 hectares |
| Approx. Average Annual Rate of Loss | 23,800 hectares |
| Total Ancient Forest Protected in 5 Parks | 75,000 hectares |
| Approx. Years Remaining of Unprotected Ancient Forest At Average Annual Rate of Loss | 32 years |

# V. THE SOUTH ISLAND: A CASE STUDY OF FOREST LIQUIDATION

The most drastic reduction in the Vancouver Island temperate rainforest occurred in the southern part of Vancouver Island. In 1954 the region south of the Alberni Canal bordered roughly by Bamfield, Nanaimo, Port Renfrew and Victoria still contained a vast expanse of extremely high quality, biologically productive and ecologically diverse ancient forests.

Most of these forests are held in Tree Farm Licences by MacMillan Bloedel, Fletcher Challenge (acquired from British Columbia Forests Products) Western Forest Products (acquired from Rayonier) and Canadian Pacific Forest Products. Most of these companies also have considerable private holdings on the South Island.

By 1990, approximately 75 percent of the ancient temperate rainforest that existed in 1954 on southern Vancouver Island had been liquidated. The mapping team projects that given the average annual rate of forest clearance for the past 36 years (8300 hectares) all remaining unprotected rainforest on the South Island will be liquidated by the year 2001.

The economic consequences of this on-going devastation are widespread and complex. Most of the best timber already has been liquidated from the South Island, and the forest companies have closed down sawmills and plywood plants directly affected by the shortage of locally available timber. The forest companies still maintain a high rate of cut on the remaining South Island forests, which on the whole are less economically productive than the rainforests logged in earlier years. In an effort to sustain a profitable operation, over the past decade the forest companies have reduced the overall size of their work force by some 40 percent. The timber-based economies of many local communities have never recovered.

The environmental consequences have been no less severe. The ancient temperate rainforests of the South Island were among the most magnificent, most productive forests on the face of the earth. Today, the forests of the Carmanah Valley, the Walbran Valley, and Sandstone, Cullite and Logan Creeks are among the last remaining intact examples of this priceless forest heritage.

The systematic liquidation of the ancient temperate rainforests of southern Vancouver Island is a major environmental crisis and requires the immediate attention of government.

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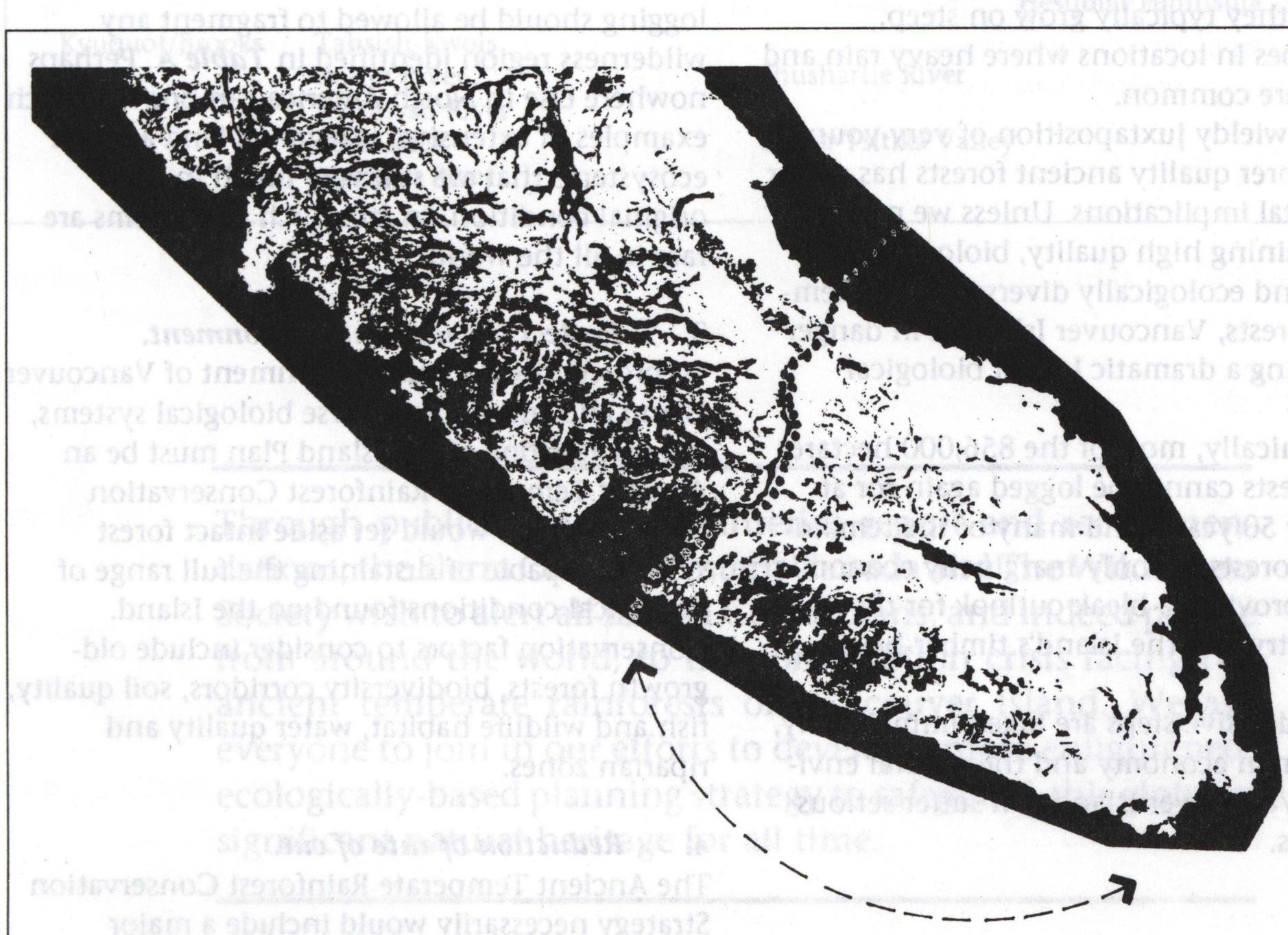
NOTE: The projections by this report that all ancient temperate rainforests on Vancouver Island will be liquidated by the year 2022, and on the South Island by the year 2001, are based on annual average rates of forest loss over the past 36 years. However, most logging on Vancouver Island takes places within various forest management units (TFLs and TSAs). The rates of logging within any one management unit will not necessarily coincide with the Island-wide average. Some management units may liquidate all their ancient temperate rainforest long before the years 2022 or 2001. Other management units may follow a logging timetable that takes them beyond those time periods. For all practical purposes, however, the preliminary data clearly shows that unless thereis a significant change in the overall rate of logging on Vancouver Island, the Island's ancient temperate rainforest will be liquidated within the time frames projected.

| SOUTH ISLAND (Preliminary Figures) | |
|---|---|
| Total South Island Land Area | 858,000 hectares |
| Ancient Forest in 1954 | 408,000 hectares |
| Ancient Forest in 1990 | 109,000 hectares |
| Total Area Logged | 299,000 hectares |
| Approx. Average Annual Rate of Loss | 8,300 hectares |
| Total Ancient Forest Protected in Parks | 12,400 hectares |
| Ancient Forests Remaining (Unprotected) | 96,600 hectares |
| Approx. Years Remaining of Unprotected Ancient Forest At Average Annual Rate of Loss | 11.6 years |



SOUTH ISLAND TEMPERATE RAINFOREST
1990

# VI. CONCLUSIONS AND RECOMMENDATIONS

There is no conservation program in place to ensure the long-term survival of the ancient temperate rainforests of Vancouver Island. On the contrary, as this study has shown, the Island has lost a full one-half of its ancient forests since 1954. Virtually all the unprotected ancient temperate rainforest still left on Vancouver Island is slated to be liquidated by the year 2022. For the South Island the end of the rainforest will occur by the year 2001.

Over half the Island's ancient temperate rainforest that existed in 1954 has been replaced by man-made plantations where every tree is less than 36 years old (856,000 hectares). Indeed, most of the young trees are likely to be less than 20 years old. With most of the high quality, low elevation forests already logged, the remaining ancient forests are of a generally inferior quality for timber production. Aside from being fragmented, they typically grow on steep, unstable slopes in locations where heavy rain and high winds are common.

This unwieldy juxtaposition of very young trees and poorer quality ancient forests has major environmental implications. Unless we protect the last remaining high quality, biologically productive and ecologically diverse ancient temperate rainforests, Vancouver Island is in danger of experiencing a dramatic loss of biological diversity.

Economically, most of the 856,000 hectares of young forests cannot be logged again for at least another 50 years. And many of the remaining ancient forests are only marginally economic to log. This provides a bleak outlook for the timber industry and the Island's timber-based economies.

Unless decisive steps are taken immediately, both the human economy and the natural environment of Vancouver Island will suffer serious consequences.

## Recommendations

1. ***Necessity for an Island Plan.***
The provincial government must develop an ecologically-based, sustainable land and water use plan for Vancouver Island. This Island-wide plan will address in a serious and equitable manner the economic and environmental requirements of present and future generations of Vancouver Islanders. It must ensure that forest sector workers benefit from a restructured economy, and that the natural heritage of the Island is protected.

2. ***Re-direction of logging away from intact ancient temperate rainforests.***
Until the new Island Plan is in place, the Ministry of Forests should grant interim logging permits to licence holders to operate in already established forest industrial areas. No road building and logging should be allowed to fragment any wilderness region identified in ***Table A***. Perhaps nowhere else in North America can one find such examples of extensive, integrated land and sea ecosystems that are still very much in their original condition. In fact, such ecosystems are rare in all the world.

3. ***Protect the natural environment.***
To protect the natural environment of Vancouver Island and sustain its diverse biological systems, the cornerstone of the Island Plan must be an Ancient Temperate Rainforest Conservation Strategy which would set aside intact forest systems capable of sustaining the full range of ecological conditions found on the Island. Conservation factors to consider include old-growth forests, biodiversity corridors, soil quality, fish and wildlife habitat, water quality and riparian zones.

4. ***Reduction of rate of cut.***
The Ancient Temperate Rainforest Conservation Strategy necessarily would include a major reduction in the rate of logging on Vancouver Island to accommodate a wide range of environmental and economic values. All logging operations must be ecologically sustainable.

5. ***Sustainable levels of employment.***
To sustain levels of employment in the forest industry despite the reduced rate of logging, the Island Plan must develop an economic transition strategy to provide forest workers with alternative employment opportunities and training.

6. ***Comprehensive inventory.***
There must be a comprehensive inventory of all the forest and biodiversity resources on Vancouver Island including fish and wildlife.

***Table A***

South Island
- Walbran Valley
- Upper Carmanah
- Lower Klanawa
- Sandstone, Cullite and Logan Creeks
- Forests bordering the West Coast Trail

Upper Nahmint Valley

Kyuquot/Brooks
- Tahsish-Kwois
- Power River
- Klashkish River
- East Creek
- Nasparti River

Clayoquot Sound
- Clayoquot River
- Bulson River
- Upper Tofino Creek
- Megin River Watershed
- Sulphur Passage, Watta Creek, and Shelter Creek to Sydney Inlet
- Vargas, Meares and Flores Islands
- Hesquiat Peninsula

Shushartie River

Lower Tsitika Valley

Through publication of this interim report and recommendations, the Sierra Club of Western Canada and The Wilderness Society wish to alert all British Columbians, and indeed people from around the world, to the conservation crisis facing the ancient temperate rainforests of Vancouver Island. We ask everyone to join in our efforts to develop a more enlightened, ecologically-based planning strategy to safeguard this globally significant natural heritage for all time.

# VI. CONCLUSIONS AND RECOMMENDATIONS

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