



COMMUNITY WILDFIRE PROTECTION PLAN

Errington, BC

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Developed through a grant from the Union of British Columbia Municipalities to the Regional District of Nanaimo for:
The Errington Volunteer Fire Department
Errington, BC

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There is no doubt in my mind that, whether it is due to global climate change or natural weather cycle, B.C. communities that build up near forests will face increasing threats of fires. They must do everything possible to restore the forests to good health and plan the design of their communities and the construction of their homes and properties to minimize the inevitable fires in the future.

*The Honourable Gary Filmon, Chairman, Firestorm 2003 Provincial Review
In Stories from the Firestorm
Okanagan Valley Newspaper Group, 2004*

From the perspective of fire protection the intermix environment is often the worst of all worlds....There is little zoning for fire control. There are few building codes to reduce hazards such as wooden roofs. There is scant pressure to reduce wildland fuels around dwellings. Open spaces that serve as buffer zones shrink as houses and woodlands expand....Narrow roads to sheltered homesites, rustic wooden houses with shake-shingle roofs, lush vegetation dripping over walls and roofs, distances from prying officials and taxes – all this is why the exurban communities were created. To render them fireproof is to recreate the environments from which the residents fled in the first place.

World Fire. 1995, Stephen J. Pyne,



Errington Volunteer Fire Department #1 Firehall

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COMMUNITY WILDFIRE PROTECTION PLAN ERRINGTON, BC

SYNOPSIS

1. Many areas in the community of Errington have a medium to high interface fire hazard rating.
In 2005, the Nanaimo Regional District (NRD) received a grant from the Union of British Columbia Municipalities (UBCM) to develop a Community Wildfire Community Plan (CWPP) for the community of Errington.
2. Errington's Community Wildfire Protection Plan:
 - 1) defines risk areas for interface fires,
 - 2) identifies measures necessary to mitigate risks, and
 - 3) outlines an action plan for improving fire protection and prevention in the interface (Plan of Action - Section 7).The success of a Community Wildfire Protection Plan hinges on public education.
3. If implemented over the next several years, the actions identified in the CWPP will help Errington clarify and refine priorities for the protection of life, property, and essential infrastructure and resources in the wildland-urban interface.

SECTION 1: INTRODUCTION AND PLANNING PROCESS

The wildland-urban interface (WUI) is commonly described as the zone where structures and other human developments meet and intermingle with undeveloped wildland or vegetative fuels. Interface areas can be sharp geographical edges, or zones of ever increasing risk potential.

The Healthy Forests Restoration Act (HFRA, 2003) in the United States defines the wildland-urban interface as an area extending about 1.1 kilometer from the boundary of an at-risk community, or an area within about 2.2 kilometers of the boundary of an at-risk community if the area has a sustained steep slope or geographic feature that creates the potential for wildfire behaviour endangering the at-risk community.

Wildfires are a part of the natural ecological cycle of forests. Human encroachment onto forested lands increases the risk of interface fire. Loss of life, property, and infrastructure are threatened. One of the most dangerous operations for fire fighters involves fire suppression in the interface zone.

COMMUNITY WILDFIRE PROTECTION PLAN PROGRAM

The concept of community-based interface planning is not new. The “Firestorm 2003 Provincial Review” provided the impetus for BC communities to participate in strategic planning. The Firestorm report, prepared by The Honourable Gary Filmon, provided a review of the damage caused in 2003 when devastating interface fires in British Columbia’s interior destroyed 260 000 ha of forest, 334 homes and businesses, forced the evacuation of more than 45 000 people from their communities, and resulted in the loss of lives of three fire fighting airmen.

The “Firestorm 2003 Provincial Review” recommended the province of BC take a leading role in the development of strategic interface management plans in cooperation with local governments. The Community Wildfire Protection Plan (CWPP) program, initiated by the province in 2004, is aimed at improving fire prevention in the interface.

The Community Wildfire Protection Plan is directed at medium- to high-risk interface communities. The CWPP is administered by the Union of BC Municipalities (UBCM) and funded by the Ministry of Forests (MoF).

The purpose of the CWPP program is to assist communities in the development of plans to assist them in improving fire prevention and protection in the interface.

The objective of the CWPP program is to improve community safety and reduce the risk of damage to property and wildlands.

The intent of the CWPP is to establish a cooperative framework under which interface management programs are developed and implemented to protect human and natural resources values in an effective and efficient manner.

SECTION 2: PROFILE OF ERRINGTON, BC

THE SETTING

The small unincorporated community of Errington is found on southeast Vancouver Island, south of Parksville, and west of Nanaimo. Errington's land area of 27.54 km² rises from coastal lowlands near the Strait of Georgia south to the lower foothills of the Beaufort Range. The forty kilometer-long Englishman River, which descends from snowfields in the Beauforts, flows along the southeastern rim of Errington. To the northwest, Errington borders the rural residential community of Coombs. The northern boundary of Errington roughly straddles the Alberni Highway (Highway 4A). The land area between these boundaries is a mix of rural residential, agricultural holdings, and forested tenures. Surrounding Errington along much of its western, southern, and southwestern borders are extensive forest lands.



Plate 1. Looking west from the vantage point at Little Mountain, the community of Errington is viewed as a vast, continuous forest.

The land area of Errington generally occupies gently to moderately rolling relief. Slopes are usually less than 20%, although steeper areas of local relief may be found (i.e., Little Mountain). Soils in the area generally developed in shallow sandy, gravelly fluvio-glacial and /or marine deposits, generally less than 1 m thick, and are underlain by compact sandy gravelly morainal deposits, or, less commonly, by deeper, sandy gravelly morainal deposits associated with extrusive bedrock areas. Soils in the area are generally well-drained, although small wetland areas may have imperfect drainage. Elevational range is between approximately 100 and 250 metres above sea level (a.s.l.).

Second- (and third-) growth coniferous forests cover a significant portion of the lands in Errington. Old-growth forests in the area were originally harvested beginning in the late 1800's. Predominant forest cover in the area is Douglas-fir, with lesser amounts of western redcedar, western hemlock (on cooler aspects) and lodgepole pine (common in rapidly drained areas). Mixed forests of coniferous /deciduous species (red alder, bigleaf maple, cottonwood) inhabit wetland areas. Arbutus is found on well-drained, warmer upland slopes.

Errington, together with its neighbouring communities of Coombs and Hilliers, forms Nanaimo Regional District's Electoral Area F. The Regional District of Nanaimo (NRD) is located in the Nanaimo Lowland physiographic subdivision, one of the fastest growing regions in Canada, and one of the most ecologically diverse areas of North America.

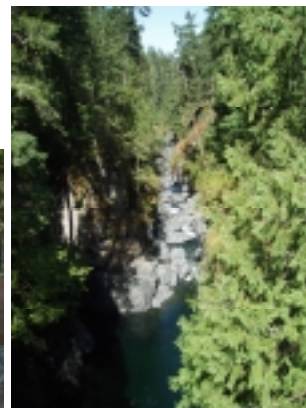
Errington is located within the Mount Arrowsmith Biosphere Reserve (MABR). The MABR is one of only 11 Biosphere Reserves in Canada. Biospheres are established by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to help communities manage unique natural environments on a sustainable basis.

LAND USE

Commercial and industrial activities are scattered throughout Errington, but are concentrated mainly along the Highway 4A corridor, where several small processing plants, machine shops, small restaurants and small service businesses are found. A small saw mill is located near the village centre of Errington.

Natural resources - forestry and agriculture - provide an economic base for the community. Forest lands are predominately privately owned. Approximately 2% of the area is occupied by farms, varying in size from small hobby farms to large dairy farms.

Tourism is important in the summer months when thousands of campers and hikers visit Englishman River Park, at the southern tip of Errington. There are no campgrounds in Errington outside of the provincial park.



Plates 2, 3, and 4. Englishman River Falls Park is a popular provincial park at Errington.

Non-monetary values of Errington's forests and waterways are significant. High recreational usage in the area includes: hiking, biking, swimming, dirt biking, fishing, scenery viewing, and wildlife observation. In addition to the popular Englishman River Provincial Park, Errington contains two NRD parks: Little Mountain Regional Park and Morison Creek Regional Park.

The Englishman River is an important water source for many of the urbanised areas of the Nanaimo Regional District. The Englishman River will soon become the supply source for the Englishman River Bulk Water System.

POPULATION

The population of Errington is approximately 3 500 (2004 BC Stats). There are approximately 1 200 households. The rate of growth in Errington from 1996 to 2001 was 19.3%, more than four times the average rate of growth in the Nanaimo Regional District over the same period of time. The majority of the population resides within the village core and rural subdivisions.

There are no designated First Nations lands in Errington.

CLIMATE

Errington is classified into two biogeoclimatic areas. The northern portion of Errington is classified as CDFmm (Moist Maritime Coastal Douglas-fir Subzone), typically encountered at lower elevations along southeastern Vancouver Island. The CDFmm lies in the rainshadow of the Vancouver Island mountains, resulting in warm, dry summers and mild, wet winters. The CDFmm represents the mildest climate in Canada.

Southern fringes of Errington higher than 150-200 m a.s.l. are classified as CWHxm1 (Very Dry Maritime Coastal Western Hemlock Subzone). The CWHxm1 has warm, dry summers, and moist mild winters with relatively little snowfall.

Growing seasons throughout the land area of Errington are long. Prevailing winds in summer are warm westerlies. Summer droughts are not uncommon, during which time the Fire Danger Rating Class reaches or exceeds Danger Class 3 for many days.



Plate 5. Forest Fire Risk at Errington often reaches Extreme.

FIRE PROTECTION

Fire services in the Errington Fire Protection district are the responsibility of the Errington Volunteer Fire Department, under Fire Chief Colin Catton. The force of 30 members maintains two fire halls, two rated engines, and two roll-on-roll-off tankers. A new four-wheel drive (4WD) bush truck being built with a high pressure pump (a technique used in Australia) will be suitable for both structure and bush fires. Errington's annual call volume is between 150 and 200 calls.

Commitment level on the Errington Fire Department (FD) is high. The chief has 16 years of service on the force, while some members of the crew have over 30 years of service. The average age of a firefighter on the Errington Volunteer FD is 35 years. There are several young fire fighters aged 19 and 20. Like many other rural volunteer fire departments, Errington finds it difficult to recruit and retain young volunteers due to rising property values and limited employment prospects in the immediate area.

The Errington FD regularly conducts interface fire training practices for the crew in the spring. A theory session dealing with interface fire management takes place every winter. Many of the crew members have taken BC Suppression Training Series courses: S-100 (Basic Fire Suppression and Safety) and S-215 (Fire in the Urban Interface).



Plate 6. Errington's main firehall is located at the junction of Errington Road and Highway 4A.

Fire Prevention

The Errington Fire Department is a proactive force. Twice a year for the past three years the department has published "Fire News", a newsletter distributed at no charge to all households in Errington. The publication includes articles on personal fire safety and interface management. Public response to the newsletter has been limited. In the spring 2004 issue of "Fire News" the FD offered free on-site consultations to the public. The FD received one call. The Fire Chief hoped to have better response in the fall of 2005 to a "Fire News" campaign promoting house numbering.

The Errington FD takes an active role in promoting fire prevention at the local elementary school. During Fire Prevention Week the FD instructs Grades 3 to 5 in the Learn Not to Burn program. Staff at the school are very supportive of the program.

Superior Tanker Shuttle Rating

The Errington Fire Department recently achieved a "Superior Tanker Shuttle" (STS) rating system from the Fire Underwriters Survey (FUS). The rating provides residents of Errington with a fire protection insurance rating equivalent to that of a residential hydrant-protected community. Residents benefit from lower insurance ratings due to the FD's ability to haul water to a fire at the same rate as a residential hydrant. Errington is the first fire department west of Ontario to achieve the STS rating.



Plates 7 and 8. Errington has achieved Strategic Tanker Shuttle rating by locating permanent, reliable water sources for firefighting throughout the district.

The process of developing a system to achieve the STS rating took the community of Errington about ten years. The project involved the acquisition of water tanks and unique tanker trucks and equipment, the use of privately owned water sources, and utilisation of other resources. Residents supported the initiative. The ability of the Errington Fire Department to flow at least 200 imperial gallons per minute (lgpm) uninterrupted for a total of two hours even at the farthest corner of the district (4.2 km from water test site) has resulted in reductions in homeowner insurance premiums ranging from \$200 to \$800. It is estimated that the entire community is saving over \$300 000 in insurance premiums.

Mutual Aid

The Errington Fire Department is responsible for fire suppression action on all lands within its fire protection boundaries. The Errington FD operates under a Mutual Aid Agreement with neighbouring fire departments. Where wildfire threatens forest or other wild land values, the Wildland Fire Service of the Ministry of Forests has a responsibility to ensure that appropriate fire suppression takes place, regardless of ownership or land status. The Ministry of Forests Coastal Fire Centre maintains an established commitment to mutual aid on all wildfires which are beyond the capability of a local fire department.

Mutual Aid - Firestorm 2003

A small contingent of fire fighters from Errington travelled to the BC's interior in the summer of 2003 to join other firefighters from across Canada battling the Firestorm blazes. The Errington FD produced a video with dramatic, live footage of the devastation caused by the interior interface fires. The video would provide an ideal tool to educate the public about the hazards of living in the interface zone.

DEVELOPMENT STANDARDS

Many residents of Errington are drawn to the area for its green space, water resources, and natural features. While these attributes contribute to the character and livability of the area, various factors are beyond the jurisdiction of the Regional District of Nanaimo.



Plate 9. Not all residences in Errington are FireSmart.

The Regional District of Nanaimo provides building inspection services and requires building permits in 90% of the populated areas of NRD. Building inspection services are not available in Electoral Area F (which includes Errington). Similarly, there is no requirement to obtain a building permit before building or altering a structure in Electoral Area F. Land use and subdivision bylaws under the NRD's Community Planning Function are not applicable in Electoral Area F. A bylaw pertaining to property maintenance or unsightly premises applies to all electoral areas except Electoral Area F.

INTERFACE HAZARD

Errington contains a volatile mix of homes and structures located within and adjacent to forested areas. Living and recreating in a fire-prone environment poses risk to homes, important infrastructure, public safety, critical watersheds, and natural resources.

While there are several rural forested jurisdictions within the Nanaimo Regional District, the Ministry of Forests Protection Mid Island Fire Zone has voiced strong concerns about the high risk of interface fire at Errington.



FIRE HISTORY

Interface fire history is an important indicator of hazard rating. The majority of wildfires in Errington over the last twenty years were started by humans. A small percentage of fires can be attributed to lightning. In the last 15 years, six lightning strikes have started fires in Errington.

Public awareness of wildfires heightened after Firestorm 2003. Prior to Firestorm 2003, the Errington FD received a handful of calls from the public to report suspect wildfires. In the summers since 2003, the FD has received countless calls reporting possible fires. The majority of calls are false alarms (i.e., dust on gravel roads), but the FD encourages call-ins of any suspicious fire activity.

Plate 10. Fire ban sign at Englishman River Park.

According to the Errington FD Fire Chief, human-caused fires have occurred (and in many cases continue to occur) at the following locations:

- Little Mountain
(chronic problem: people throw flaming debris from the cliff to the forests below)
- Englishman River subdivision
(homeowners inadvertently started bush fires during construction phase, and when burning backyard debris)
- Middlegate subdivision
(homeowners inadvertently started bush fires during construction, and when burning backyard debris)
- Dunn Road
(slash fire as a result of logging activity)

- Industrial park along Highway 4A
(teens regularly start fires in vacant lands off Springhill and Coldwater Road)
- Gravel Pit at industrial park along Highway 4A
(traditional site of Grad parties)
- Stagdowe Road
(teen parties)
- Grafton Road
(frequent fires a few years ago coincided with subdivision development)
- Fisher Road
- Brush land off Leffler Road
(teen parties in summer)

The community of Errington has been fortunate, notes the Fire Chief, that all fires in recent years in the interface zone have been relatively small, and have not been fanned by strong winds.

SECTION 3. PREPARATION OF A COMMUNITY WILDFIRE PROTECTION PLAN

A community should follow basic steps in the development of a wildfire protection plan. Community interface fire planning need not be a complex process.

Practical approaches to community planning are in effect in several countries with interface fire problems. Australia has developed guidelines to improve safety in Bushfire Prone Areas. The national Fire Safe program in the United States is responsible for providing access to and interpretation of fire safe laws and regulations covering general fire prevention and wildland fire safety.

The FireSmart program in Canada uses up-to-date scientific information to provide practical tools and information for use by interface residents, government, firefighters, and industries that operate in the wildland-urban interface. The following basic steps for developing a community wildfire protection plan are adopted from FireSmart (*FireSmart: Protecting Your Community from Wildfire*, Partners in Protection, 2003).

STEP ONE: Plan overview - develop programmatic goals

The first step in developing a Community Wildfire Protection Plan should be liaison with key, decision-making agencies responsible for forest and land-use planning: local government, local fire authorities, and Ministry of Forests Protection. Programmatic goals can be formulated at this time.

STEP TWO: Data Acquisition and Information Sharing

The next step is to acquire data in order to share perspectives, priorities, and other information relevant to the planning process.

The intent is not to duplicate existing data, but to integrate information and resources.

Several useful community-planning guides and resources were used in the development of this project:

- *FireSmart - Protecting Your Community from Wildfire* (2nd Edition, Partners in Protection, 2003)
- *Firestorm 2003 Provincial Review*
- *Addressing the Interface Fire Hazard - A Case Study of the District of Langford* (District of Langford, 2002)
- *Water Supply for Public Fire Protection* (Fire Underwriters Survey, 1999)
- *National Fire Protection Association (NFPA) Standards* (NFPA, Massachusetts, USA)
- *Official Community Plan* (Electoral Area F)

STEP THREE: Hazard - Risk Assessment

A community hazard - risk assessment is an effective means of identifying areas at risk.

Various models are available to evaluate interface hazard and risk. Models selected should consider a range of factors, including:

- Fuel hazards
- Fire weather
- History of wildfire occurrence
- Structures, features, and essential infrastructure at risk
- Other community values at risk
- Local preparedness and firefighting capability

Applicants of Community Wildfire Protection Plans were encouraged to use Strategic Threat Analysis (STA) mapping, a GIS mapping resource recently made available in the province of BC. Existing STA mapping coverage of southeastern Vancouver Island is extremely limited in coverage, and of doubtful merit, and was not used in this project.

STEP FOUR: Hazard mapping

Based on hazard-risk assessments, interface hazard mapping is developed to identify:

- Areas at potential risk from wildland fire
- A designation of the community's wildland-urban interface zone

Ortho photography is useful in field mapping. Final mapping in this project is presented in digital format (GIS), using cadastral, topographic, and TRIM information.

STEP FIVE: Community Hazard Reduction Priorities

Once the community assessment and base map are completed, local protection and hazard mitigation needs should be addressed. The community may also want to identify and develop strategies to improve emergency preparedness and fire response capability.

STEP SIX: Develop an Action Plan

Measures necessary to mitigate risks need to be identified in an action plan.

STEP SEVEN: Finalise the CWPP

The core group of key, decision-making agencies should reconvene to mutually agree on fuel treatment priorities, preferred methods for fuel treatment projects, location of the wildland/urban interface, and other information and actions to be contained in the final CWPP.

STEP EIGHT: Education and Awareness

Effective public education and awareness will help motivate people to create FireSmart communities. Once the base awareness program is developed, target a wider audience. Substantive input from a diversity of interests will ensure the final plan reflects the highest priorities of the community. It will also help to facilitate timely implementation of recommended projects. The process of developing a CWPP can lead community members through valuable discussions regarding management options and implications.

STEP NINE: Implementation

Implementation of an assessment strategy ensures the Community Wildfire Protection Plan maintains its relevance and effectiveness over the long term.

SECTION 4: HAZARD-RISK ASSESSMENT

HAZARD ASSESSMENT METHODOLOGY

Hazard assessment methodology used in the development of this Community Wildfire Protection Plan was based on standard fire danger and hazard assessment models.

Canadian Forest Fire Danger Rating System (CRRDFS)

The Canadian Forest Fire Danger Rating System (CFFDRS), developed by Forestry Canada, is a highly accredited system for evaluating daily forest fire danger (Figure 1). The CFFDRS comprises two major subsystems: the Fire Weather Index (FWI) system and the Fire Behaviour Prediction (FBP) system.

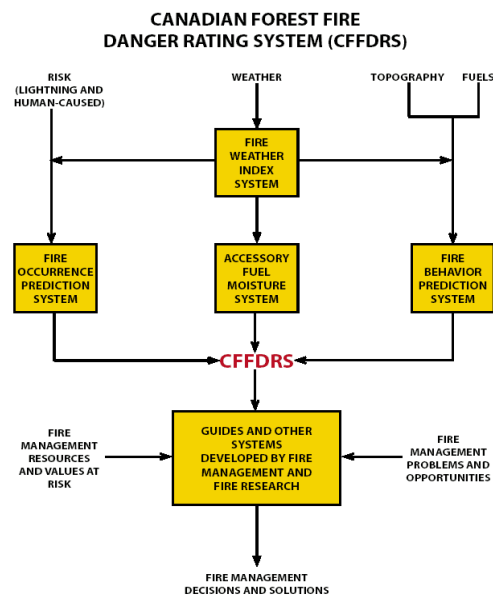


Figure 1. Canadian Forest Fire Danger Rating System

Six components of the FWI account for the effects of fuel moisture and wind on ignition potential and probable fire behaviour. Three fuel moisture codes reflect the fuel moisture content of fine surface litter (Fine Fuel Moisture Code - FFMC), loosely compacted duff of moderate depth (Duff Moisture Code - DMC), and deep compact organic matter (Drought Code - DC).

The FWI fuel moisture codes plus wind are linked in pairs to form two intermediate and one fire behaviour index. The Initial Spread Index (ISI) combines the effects of wind and fine fuel moisture content (FFMC). The Buildup Index (BUI), based on DMC and DC represents a measure of the total fuels for combustion.

Each component of the FWI System conveys direct information about certain aspects of wildland fire potential. For example, the FFMC is a useful indicator of the probability of human-caused ignition, as is the DMC for lightning-caused ignitions. The DC and BUI are

excellent indicators of smoldering combustion or fire persistence in deep, compact organic layers, and hence of mop-up difficulty.

The FBP System predicts the rate of spread, fuel consumption, and intensity of wildfires. These characteristics are determined by the prevailing weather severity, fuel type, slope steepness, geographic location, elevation, and calendar date.

The FBP System also addresses variation in fuel types. The FBP System provides quantitative outputs of fire behaviour characteristics for 16 major Canadian fuel types with different stand structure and composition, surface and ladder fuels, and forest floor cover and organic (duff) layer.

Interface Community Fire Hazard Analysis

In this project, data obtained from the CFFDRS was integrated in the Ministry of Forests Protection Branch “Interface Community Fire Hazard” analysis. The MoF analysis, adopted from FireSmart (and customised for use on the BC south coast) provides a quantitative procedure for assessing the interface fire hazard (i.e., potential fire behavior, structures at risk, susceptibility to ignition, and suppression constraints). Assigning points - the greater the hazard, the greater the number of points - indicates how each item contributes to the hazard. Hazard categories are low, moderate, high, and extreme. An interface area, site, or structure is not considered to be “fire safe” unless it obtains a low or moderate assessment score.

Hazard, Impact, Risk and Vulnerability (HIRV) Process

A community-based model, developed by Dr. L. Pearse at UBC, provides an integrated approach for community Hazard, Impact, Risk and Vulnerability (HIRV) analysis. The HIRV model is designed to assist local government in the development of mitigative strategies vis-à-vis hazards.

Hazard and risk factors identified in the CFFDRS and Interface Community Fire Hazard analyses were incorporated in the Hazard, Impact, Risk and Vulnerability model.

The HIRV process consists of:

- Hazard Identification
- Risk Analysis
- Vulnerability Assessment
- Impact Analysis
- Risk Management

Hazard can be loosely thought of as the product of risk, vulnerability, exposure, and the capacity of humans to respond to extreme conditions. For the purposes of this report, hazard refers to an unplanned or unwanted natural or human-caused fire, or a prescribed fire that threatens to escape its bounds.

Risk is a measure of the probability of occurrence of an event and the expected severity, and an analysis of potential factors (human or natural) which can contribute to the potential for fire occurrence.

Risk should not be confused with risk of ignition. For the purposes of this report, the risk of ignition can be accounted for by assigning a higher hazard rating to areas where fires are most likely to be started. Table 1 compares risk of ignition at common locations.

Table 1. Risk of ignition.

Location	Ignition Risk
Areas within 20 m of any roads and trails	Moderate to High
Areas within 20 m of power lines	High
Areas within 50 m of housing	High

Vulnerability defines the ability of people, property, industry, resources, and areas of environmental and historic concern to weather, resist, or recover from the impacts of a hazard in the long term as well as the short term.

Impact is assessed through the use of social factors, environmental factors, and political factors. Impact analysis provides the necessary links between vulnerabilities and hazards.

The following factors need to be present to implement the HIRV model:

- risks must be clearly communicated
- available data must be accessible
- process must be educational for the community at large
- process must provide for equity across the community
- scientific and technical knowledge need to be included
- hazards and risk factors must be comprehensively identified
- process must be a politically legitimate process
- public participation is essential

HIRV ANALYSIS

The first step in the risk analysis phase of the HIRV model is to divide the community into areas or polygons with similar characteristics. Stratification of the community into WUI Risk and Vulnerability Areas allows a comparative analysis of risks and hazards.

WUI Risk and Vulnerability Areas in this project were stratified using environmental, cultural, economic, social, recreational, and political values incorporated in the foregoing models, including: general location, fuel types, fuel loading, fire history, aspect, topography, type of development, access, high-use travel corridors, above-ground utility corridors, historic areas, private land with structures, timber areas, developed recreation sites, watersheds, wildlife habitat, and summer home sites.

Some discretion needs to be used in the precise location of hazard boundaries. Areas rated "extreme" or "high" for fire hazard are generally contiguous to, or consist of

extensive timbered areas with high fuel loading (generally outside fire protection area boundaries). Due to the proximity of undeveloped areas to several “built-up” areas, and the fuel that some types of buildings can provide for wildfire, fire risk boundaries could be extended into residential areas if there are no significant firebreaks separating the high risk fire hazard areas and development. The hazard rating is affected by numerous factors, including response time, water supply for fire fighting, and size and configuration of an interface property. In any case, an interface area, site, or structure is not considered to be “fire safe” (FireSmart) unless it obtains a low or moderate rating.

SECTION 5: INTERFACE HAZARD-RISK-VULNERABILITY

WUI Risk and Vulnerability Areas in this project were stratified using various criteria developed in the foregoing models, including general location, fuel types, fuel loading, fire history, aspect, access, important infrastructure, and cultural, environmental, economic, social, recreational, and political values.

The following WUI Risk and Vulnerability Areas were identified at Errington:

WUI Area 1: Highway 4A frontage, including Allsbrook Road

WUI Area 2: Little Mountain, Fairdow/Bellevue

WUI Area 3: Englishman River and Grafton Road subdivisions

WUI Area 4: Village core

WUI Area 5: Rural residential and agricultural lands

WUI Area 7: Englishman River Park

WUI Area 9: South End - lands abutting industrial forest lands

Area 1 Risk: Mod to High (to Extreme) Vulnerability: High

Highway 4A Frontage, including Allsbrook Road

General Description: Generally well-accessed; located on or near major travel arteries - Trans Canada Highway, Highway 4A, E&N Rail; light industry - commercial and industrial - and service businesses - restaurants and catering establishments, including one gas station and convenience store.

Interface Issues:

- No community piped water
(gas station is installing water tank for fire fighting purposes to comply with industry standards)
 - Vacant lands in west are problematic - scene of several human-caused fires (teens)
 - Invasive broom on vacant lands is extremely flammable
 - Small service businesses not subject to stringent building inspections
-

WUI Risk and Vulnerability Area 2 Risk: High to Extreme Vulnerability: High
Little Mountain vicinity; Leffler Road

General Description: Rural residential areas - subject to frequent bush fire activity.

Interface Issues:

- Poorly accessed (narrow steep, one-way to Little Mountain; no through-access on Leffler)
 - Little Mountain Regional Park adjoins Little Mountain
 - Forestlands in area have high fuel loading
-

- Large area with limited accessibility
- Fires pose significant risk to homes in area

WUI Risk and Vulnerability Area 3 Risk: High to Extreme Vulnerability: High
Englishman River Road and Grafton Road subdivisions

General Description: Rural residential subdivisions with small to medium forested acreages. Most of the subdivisions are now “built-up”, but frequent fires occurred during the construction phase a few years ago.

Interface Issues:

- Long response time
- Many homes do not have a fuel-free 10 m zone
- High recreational values associated with lands bordering Englishman River: mountain biking, hiking, dirt bikes, quads
- Many homes with cedar shake roof
- House numbering not always evident
- Significant portion of forest cover in area consists of lodgepole pine (high flammability)
- One-way access routes common
- Englishman River attracts increasing numbers of summer hikers and swimmers who do not reside in the local area
- Frequent evidence of fires near subdivision road and trail accesses to Englishman River



Plate 11. Evidence of man-made fires is common near accesses to the Englishman River.

WUI Risk and Vulnerability Area 4 Risk: Moderate to High Vulnerability: Mod to High
Village core

General Description: Small village centre with several small businesses (including a small saw mill and gas station), older homes, and community centre. The saw mill has an independent water system for fire fighting. Good access from Errington Road. Low fuel (vegetation) loading.

Interface Issues:

- Community Centre on Veterans Road is an old, wooden, flammable structure - “a box of kindling” (FD)
- Obsolete 100 yr old elementary school is boarded up - potential arson site
- Older homes in area are combustible



Plate 12. Errington Community Centre is an aging, combustible structure.

WUI Risk and Vulnerability Area 5 Risk: Moderate to High Vulnerability: Moderate
Rural residential and agricultural lands

General Description: Extensive area of lightly populated rural residential and agricultural lands. Many small to large acreages. Farms are generally well-managed, with regularly scheduled hay crops (Plate 13).

Interface Issues:

- Many acreages have significant fuel (vegetation) loading
- Many structures do not have 10 m fuel-free zone
- Many residences lack house numbering
- Moderate recreational values: hiking, biking, dirt biking
- Older homes and structures are more combustible
- Contiguous forest lands



Plate 13. Large, well-maintained farms serve as viable fire breaks in Errington.

WUI Risk and Vulnerability Area 6 Risk: High to Extreme Vulnerability: High
Englishman River Provincial Park

General Description: Popular BC provincial park, especially in summer months - features upland forested trails and access to Englishman River. Campground often full in summer; park "host" system in operation in the summer of 2005 - on-site wardens monitored vandalism and potential fire activity; standpipes supply low pressure water supply for fire fighting

Interface Issues:

- Wildland areas with significant inaccessibility
- Close proximity to residential mobile home park on Errington Road
- High environmental and recreational values
- Often exempted from coastal-wide campfire ban
- Scene of several human-caused fires
- Trails extend northwards out of park



Plate 14. Fuel loading is moderate to high along many trails in Englishman River Provincial Park.

WUI Risk and Vulnerability Area 7 Risk: High to Extreme Vulnerability: Moderate to High
South End - lands abutting Forest Land Reserve

General Description: Lightly populated areas along Errington's southern boundary - borders privately owned industrial forest lands (various tenures)

Interface Issues:

- Scene of several human-caused fires
- Popular area for mountain biking and dirt biking (Hammerfest Trails)
- Recent, frequent turnover in forest land tenures
- Hydro Right of Way well-used access route
- Major restructuring of the forest industry makes it difficult to identify operators currently working in the Errington area



Plates 14 and 15. Active logging operations border many areas of Errington. Logging slash is flammable until green-up occurs, usually a few years after logging.



The Interface Zone

HIRV models were developed for each of the WUI Areas. The following tables demonstrate the range of risk factors present in Errington (WUI Zone 2 - Little Mountain, Leffler, and WUI Zone 6 - Rural residential, agricultural). Risk and vulnerability are significantly higher at the Little Mountain/Leffler area compared to rural agricultural lands with good access and low fuel loading.

Table 2. Hazard Impact Risk and Vulnerability Model

Hazard	Risk Rating	Certainty	Vulnerability Rating	Certainty	Impact Analysis*	Certainty	Risk and Vulnerability Analysis
WUI Fire Little Mt/ Leffler	High to Extreme	Well established	High	Well establish'd	Env=3 Soc=3 Econ=3 Pol=2-3	Well established	Risk= High to Extreme Vulnerability= High

* Env=Environmental Soc=Social Econ=Economic Pol=Political Ratings: 1=Low, 2=Moderate, 3=High, 4=Extreme

Table 3. Hazard Impact Risk and Vulnerability Model

Hazard	Risk Rating	Certainty	Vulnerability Rating	Certainty	Impact Analysis*	Certainty	Risk and Vulnerability Analysis
WUI Fire Rural Residential areas - Rural residential/ Agriculture	Moderate (to High)	Well established	Moderate	Well establish'd	Env=2 Soc=2 Econ=3 Pol=2	Well established	Risk=Moderate to High Vulnerability= Moderate

* Env=Environmental Soc=Social Econ=Economic Pol=Political Ratings: 1=Low, 2=Moderate, 3=High, 4=Extreme

Table 4 evaluates risk probability versus consequence. The table evaluates the WUI fire hazard with the potential threats to life, property, and the environment. Ranking criteria are presented in Table 5.

Table 4. Risk Rating

Identified Hazards	Life Safety	Property Damage	Environmental Damage	Economic Impact
WUI Vulnerability Zone 1	High	High	Moderate	High
WUI Vulnerability Zone 2	High to Extreme	High	Moderate to High	Moderate

WUI Vulnerability Zone 3	High to Extreme	Moderate	Moderate to High	Low to Moderate
WUI Vulnerability Zone 4	High	High	Low to Moderate	Moderate to High
WUI Vulnerability Zone 5	Moderate	Moderate	Moderate	Moderate to High
WUI Vulnerability Zone 6	High to Extreme	Low to Moderate	High to Extreme	Moderate to High
WUI Vulnerability Zone 7	High	Low to Moderate	High to Extreme	High to Extreme

Table 5. Ranking Criteria

Consequence Criteria		
Life Safety	Low Medium High Extreme	Injuries limited to the area of effect. <10 Serious injuries >10 Possible fatalities, serious injuries Multiple fatalities, critical and serious injuries
Property Damage	Low Medium High Extreme	Minimal damages Structural damages evident Loss of structures Large-scale loss of structures
Environmental Damages	Low Medium High Extreme	Minimal impact at area of effect Regional damage Long-term recovery. Requires significant after action Severe long-term effects
Economic Impact	Low Medium High Extreme	Economic impact minimal Loss of business Regional long-term loss Chronic, long-term economic downturn

SECTION 6: MITIGATIVE ACTIONS – A DISCUSSION

MITIGATIVE MEASURES

Education and public awareness are vital to effective interface hazard mitigation. Mitigative measures should target:

- Vegetation Management
- Structural Options
- Infrastructure

EDUCATION AND PUBLIC AWARENESS

The crucial key to preventing or minimising fire risk in the wildland-urban interface is effective public education. An informed, knowledgeable community will make the best decisions about interface management.

“By developing the plan in true collaboration with the community and agency partners, you’ve always got people who want to maintain it.”
North Fork Wildfire Plan, Sundance, Utah

Promotion of interface management should always involve community fire agencies (local fire department and Ministry of Forests wildland fire service).

Recommendations:

Discuss programmatic goals with:

- *Local government*
- *Homeowners*
- *Neighbouring tenure holders (i.e., forestry companies, BC Parks, NRD)*

Be assured of public participation:

- *Provide access to the CWPP on the internet*
- *Notify property owners in high hazard areas by phone or mail*
- *Facilitate scheduled public meetings for residents living in the wildland-urban interface*

Interface action is urgent:

- *Promote Errington FD’s video of Firestorm 2003 with local population and other interface communities on Vancouver Island.*

Once the awareness program is developed, target:

- *School-age children (school programs)*
- *Building contractors (promote fire resistant building materials)*
- *Real estate firms (promote FireSmart structures and neighbourhoods)*
- *Insurance industry (adequate fire response)*

- **Media**
- **Utility companies**
- **Tourism- and recreation-related businesses (educational pamphlets, signage)**
- **Ministry of Transportation and Highways (informative meetings)**

Strategic approaches are required for specific audiences.

Recommendations:

- **Prior to any meeting, be prepared to discuss short- and long-term goals:**
 -Short-range project goals may include cleaning roofs or displaying an address sign
 -Long-term project goals may include developing community fire breaks or community water supplies
- **Encourage homeowners to host or sponsor a neighbourhood meeting.**
- **Challenge attendees to hold neighbourhood work days and share rental days for chippers and other equipment to remove unwanted brush, trees, and debris generated during clean-up bees.**
- **Develop community-sponsored events (i.e., slash pickups, firewood fundraisers) to reduce costs to individual homeowner.**
- **Invite a variety of informed speakers to meetings: fire chief, local planning representatives, emergency preparedness staff, provincial forestry staff**

Inject creativity in fire prevention.

Recommendation:

- **Challenge school group and / or the public (including summer tourists) to create clever slogans promoting interface fire prevention:**

Our forests are dry Our grass is drier Don't be the one Who starts A fire	The blackened forest Smolders yet Because He flipped A cigarette	Just one spark It is no joke And all of this Goes up In smoke	Careless fires In a flash Can turn Our mountains Into ash	A match or butt From careless folk Our beautiful forest Goes up In smoke
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FireSmart (2003) is a valuable information tool. The local fire department has made significant efforts to promote FireSmart.

Recommendations:

- **Continue to distribute the FireSmart booklet to all property owners in the spring.**
- **Cooperate with MoF Protection on a "short" version of the FireSmart booklet -i.e., attractive, easy-to-read one-page, information sheet (in response to some people who say that the FireSmart booklet contains too much information).**

VEGETATIVE MANAGMENT

Vegetation (fuel) management in interface areas is vital to the reduction of fire danger. During a major interface fire with a number of homes at risk, firefighters may be forced to prioritise their actions using a triage concept - saving only those structures that can be readily protected.

Fuel Modified Zones

FireSmart recommends the establishment of fuel modified areas around structures in the interface. Fuel modified areas between a building and a potential wildland fire have combustible materials and vegetation removed, reduced, or converted to reduce the potential for an advancing wildland fire to spread to the building, or conversely, for a building fire to spread to the adjacent wildland (Figure 2).

Priority Zone 1: Area within 10 m of a building - Fuel Removal and Conversion

Priority Zone 2: Area 10-30 m from a Building - Fuel Reduction

Priority Zone 3: Area 30-100 m from a Building - Fuel Reduction and Conversion

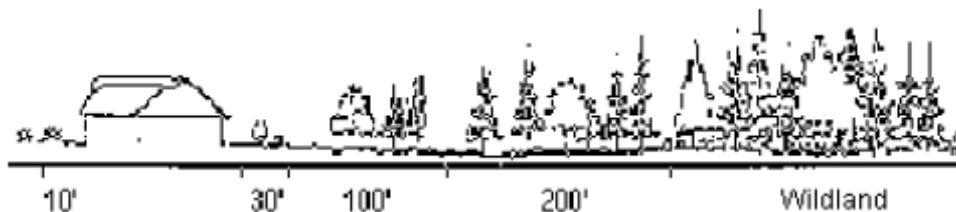


Figure 2. Vegetation management in neighbourhoods with high interface hazard should focus on the establishment and maintenance of Priority Zones around structures.

Recommendations:

- *Fuel Modification Zones should be established and maintained around new structures in areas with a high to extreme interface hazard.*
- *Existing property owners should be encouraged to establish and maintain Fuel Modification Zone around structures in areas with a high to extreme interface hazard.*

Community Fireguards

Community firebreaks act as barriers to fire spread. Firebreaks are made by clearing or thinning vegetation (fuels) on a strip of strategically located land.

Recommendations:

- *Determine the feasibility of establishing firebreaks on edges of rural residential areas bordering areas with significant long-term fuel loading (i.e., Englishman River subdivision, Little Mountain subdivision).*
- *Pursue funding through UBCM to conduct Fuel Treatment Pilot Projects in high hazard interface areas (i.e., rural residential areas bordering forest tenures and parklands).*

Disposal of Vegetation (Fuels)

Fuel reduction can result in large amounts of material requiring disposal. Homeowners burning backyard piles often inadvertently start brush fires. Disposal of vegetation can use several methods:

- Landfill disposal
- Composting
- Chipping
- Salvage
- Prescribed Burning

Recommendations:

- *Promote community composting program.*
- *Encourage homeowners to compost deciduous litter and grass clippings.*



- *Determine feasibility of using mechanical chippers to process slash:
-Chipped material could be used by landscape industry, horse ranches, and gardeners.*
- *Utilise non-merchantable material - firewood- cleared from public and private lands for community fundraisers (i.e., fire department equipment).*
- *Use prescribed burning as a viable tool for reducing on-site fuel loading (under careful supervision, and under optimum weather conditions).*

STRUCTURAL OPTIONS

Fire mitigation strategies must address the safety of buildings in the interface zone. Design standards for the construction or retrofit of interface buildings should include:

- Roofing - fire-retardant roof covering assemblies rated Class A, B, or C (i.e., metal, tile, ULC-rated asphalt)
- Siding - non-combustible siding materials (i.e., stucco, metal siding, brick, cement shingles or cementitious materials, poured concrete, or ULC-rated wood siding)
- Methods of self-protection, such as sprinklers (as recommended in the “Firestorm 2003 Provincial Review”)



Recommendations:

- ***Require new structures in high to extreme interface areas to be constructed with fire-retardant roofing and non-combustible siding.***
- ***Homeowners in the interface should be encouraged to invest in methods of self-protection such as sprinklers.***

INFRASTRUCTURE

Infrastructure includes the network of roadways, open spaces, water supply and utilities that comprises a community. Infrastructure also includes planning tools available to local government to protect life and property in the interface.

Access

“With all subdivisions, you need ingress and egress, otherwise you put people, including our volunteer firemen, at risk...”

Lewis & Clark county commissioner
At Home in the Woods. FEMA, 2004

Access routes should be built and maintained to facilitate safe and efficient access for both residents and firefighters. Roads should be designed using looped networks capable of accommodating two-way access. All development should have at least two access routes. Roads should meet minimum standards for width, gradient, and curvature standards.

Driveways should not restrict the access of the largest emergency vehicle likely to be operated on the driveway. Like roads, driveways should meet minimum standards for width, gradient, and curvature standards. Long driveways should provide an adequate turnaround at the closed end, and should provide adequate turnouts.



Recommendations:

- *Require standards of new roads and driveways to meet minimum FireSmart guidelines, to be designed in accordance with the latest edition of the "Manual on Geometric Design Standards for Canadian Roads and Streets".*
- *Work with NRD and Ministry of Transportation and Highways (MOTH) to improve access to frequent party site at wooded area off Leffler.*
- *Establish a vital second exit from Englishman River Road (through the construction of a gated, fire access driveway connecting the east ends of Englishman River Road and Middlegate Road).*
- *Encourage house numbering.*

Water Supply

Errington has successfully achieved Superior Tanker Shuttle rating. Other rural communities on Vancouver Island are encouraged to follow Errington's lead.



Recommendation:

- *Promote Superior Tanker Shuttle (STS) system in other rural areas of Vancouver Island.*

Supplementary water supply for fire fighting

Supplementary water supply for fire fighting purposes is recommended at individual residences in high interface hazard areas (NFPA, MoF Protection, FireSmart 2003). The minimum recommended supply is 7570 L. Supplementary water for fire fighting purposes may be installed uphill as a gravity-feed system. Vented, steel bolted, upright tanks on concrete slab provide suitable water storage vessels. Storage vessels should have 37-mm hose connections, and be within 15 m of the structure.

Emergency water Supply

Interface buildings without a pressurised water system should have at least one large water barrel and a 10-L fire pail.

Recommendations:

- *Encourage existing property owners in high to extreme interface areas to install on-site water supply and pumps for firefighting purposes.*

- ***Encourage residents of existing interface properties lacking a pressurized water system to have at least one large water barrel and a 10-L fire pail.***

Fire Fighting Services

The Errington volunteer fire department is a well-trained dedicated force. It is difficult to recruit and retain younger fire fighters. Providing incentives to recruits might encourage new members.



Recommendation:

- ***Consider funding Emergency First Aid training (or other specialised, applicable training) for new volunteer fire fighters, with the proviso that fire fighters who receive specific training must provide service for at least one year.***

Planning Tools

Various planning tools available to local government are preventative measures to reduce the risk of lives and structures in the interface. These tools, used at the time of subdivision, planning, and building and servicing, are generally applicable to new development, not existing lots and structures.



Development Permits

Section 919.1 of the Local Government Act provides authority to designate specific areas as Development Permit Areas. In such cases a development permit would be required prior to the development or redevelopment of a site or area. Development Permit Areas are designated for specific purposes, including protection of development from hazardous conditions (i.e., wildfire). A development permit may include requirements respecting the character of the development, including landscaping, and the siting, form, exterior design and finish of buildings and structures. Under the Local Government Act, Development Permit areas must be designated in an Official Community Plan (OCP).

Recommendation:

- ***Designate Development Permit Areas for wildfire in Official Community Plan.***

Wildland-Urban Interface Assessment

Prior to the issuance of a development permit, the applicant should be required to submit a Wildland-Urban Interface Assessment, conducted by a qualified RPF with relevant applicable experience.

Recommendation:

- ***A Wildland-Urban Interface Assessment, conducted by a qualified RPF with relevant applicable experience, should be conducted (at the applicant's expense) in high to extreme interface hazard areas, prior to issuance of a development permit.***

Covenants

Section 219 of the Land Title Act permits local governments to request Section 219 covenants. The covenants can be utilised to address interface fire protection measures (i.e., Fuel-Free Zones around structures, on-going vegetation maintenance, building materials and design, and installation of sprinklers).

Limitations to the use of covenants include difficulty in enforcing over time, and existing properties and structure are not subject to the covenants.

Recommendation:

- ***Register a Section 219 Covenant against the title of lot(s) in DP Areas for wildfire in order to address ongoing interface fire protection measures.***

Local Building Bylaws

Under the Local Government Act, local governments may include in their own building bylaws specific to areas at high risk for interface fires. Section 694 (1) allows local governments to mandate fire resistant building construction.

Recommendation:

- ***Use local building bylaws to ensure fire retardant construction materials are used in high hazard interface areas.***

Forestry Lands

Cooperation with neighbouring land users is an important factor in interface management. Restructuring of several forestry companies on southeastern Vancouver Island has resulted in a confusing landscape of tenure holders and subcontractors. The

Errington Fire Department and MoF Wildland Fire Department need to know who to contact in an emergency.

Recommendations:

- ***Identify tenure holders bordering Errington.***
- ***Collaborate with MoF Protection and forestry companies operating in the vicinity of Errington to produce an emergency fire plan, to be updated annually.***

Trail Patrols

Each summer, a growing number of visitors use the popular network of trails along the Englishman River.

- ***Encourage NRD and BC Parks to institute a system of regular patrols of forested trails during fire season.***
- ***Encourage residents in high-risk interface neighbourhoods to institute “Forest Watch” patrols during fire season.***

SECTION 7: EXECUTIVE SUMMARY – PLAN OF ACTION

Hazard mapping conducted for Errington’s Community Wildfire Protection Plan indicates that 90% of the district is at a high to extreme risk of interface fire (Appendix 1). As noted in Section 4, forest lands generally “default” to high or extreme interface ratings due to higher vegetation (fuel) loading compared with developed (“built up”) areas.

Errington has made significant strides to reduce the threat of interface fire. Awarding of the Superior Tanker Shuttle rating to Errington indicates the community is committed to protection and fire prevention.

Mitigative action is primarily a responsibility of the community. Local government, in concert with provincial fire protection agencies, can take the lead in development and implementation of risk reduction strategies and policies.

Effective public education and community involvement can encourage home and property owners to take their own preventative measures in interface fire risk areas.

Government planning tools can be used to ensure preventative measures are taken in new development.

The following recommendations are aimed at reducing the risk of interface fire:

Education and Community Involvement:

- **Strive to involve the public in interface issues through an effective education and public awareness program.**
- **Promote Errington Fire Department’s video of Firestorm 2003 with the local population and other communities on Vancouver Island.**
- **Identify forestry tenure holders bordering Errington.**
- **Collaborate with MoF Protection and local logging operators to produce an emergency fire plan, to be updated annually.**
- **Cooperate with Nanaimo Regional District and BC Parks on fuel reduction strategies in parklands bordering residential neighbourhoods.**
- **Encourage existing property owners in high to extreme interface areas to install on-site water supply for firefighting purposes.**
- **Encourage residents of local neighbourhoods to enact “Forest Watch” patrols of wooded access trails during the fire season.**

- Cooperate with BC Parks and Nanaimo Regional District to provide evening and weekend patrols of forested trails during fire season.

Vegetation Management:

- Encourage property owners to establish and maintain Fuel Modification Zones around structures in high to extreme interface areas.
- Investigate the feasibility of establishing community firebreaks along edges of neighbourhoods bordering areas with significant long-term fuel loading (through UBCM Fuel Treatment Pilot Projects, i.e., lands bordering forest tenures).
- Reduce fuels along popular trail system on west side of Englishman River, from southern boundary of Englishman River Park to gravel road opposite Catherine Place.
- Encourage residents in high hazard areas to landscape with fire resistive vegetation.
- Encourage area nurseries to produce fire-resistive vegetation.
See FireSmart Landscaping on Southeastern Vancouver Island (brochure), Strathcona Forestry Consulting, 2004
<http://www.district.langford.bc.ca/document/brochures/FireSmartLandscaping.pdf>
- Develop a community composting program.
- Experiment with mechanical chippers and other machinery to process slash.
- Utilise non-merchantable material - i.e., firewood- from fuel reduction programs for community fundraisers.
- Use prescribed burning as a viable tool for reducing on-site fuel loading (under careful supervision, and under optimum weather conditions).

Infrastructure- Planning Tools:

- Designate DP areas for wildfires (in Errington) in Area F OCP.
- Prior to the issuance of a development permit, require the applicant to a Wildland-Urban Interface Assessment, conducted by a qualified RPF with relevant applicable experience.

- Utilise Sec. 219 covenants to address interface fire protection measures (i.e., Fuel-Free Zones around structures, on-going vegetation maintenance, building materials and design, and installation of protective sprinklers.
- Use local Building Bylaws to provide preventative measures at new structures in high risk areas.
- Liaise with local government and UBCM to determine who is ultimately responsible for ongoing fire protection and risk mitigation - fire department, local government, or property owner?

Infrastructure:

- Encourage the fire department to utilise and /or acquire equipment with bush capabilities.
- Provide incentives to encourage and retain new volunteer fire fighters (i.e., funding for certain types of applicable training not currently paid for by fire departments).
- Provide through-access on Leffler in order to combat summer parties / fires in brushy area off road, and also to improve emergency response time to Englishman River subdivision.
- Cooperate with BC Parks and Nanaimo Regional District to manage popular trail system on west side of Englishman River, from Englishman River Park to Allsbrook Road access.
- Establish a gated, fire access driveway from the eastern ends of Englishman River Road to Middlegate Road.

SECTION 8: IMPLEMENTATION

No plan is complete until it is implemented.

The recommendations contained in this Community Wildfire Protection Plan should be reviewed within three months of formal adoption of the plan. Maintenance of the CWPP should include an annual schedule for monitoring and evaluating the programmatic outcomes established in the Plan. A thorough review should also take place every five years.

Regular evaluations of the CWPP should 1) assess the effectiveness of programs, and 2) identify any changes in hazard-risk assessments.

Coordinating agencies responsible for various implementation processes should report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised or removed. Organizations participating in the Plan evaluation should be clearly identified in the evaluation.

Fire protection and prevention in the interface is an ongoing process.



APPENDIX 1. INTERFACE HAZARD MAPPING - ERRINGTON

