



**CONSERVATION ASSESSMENT
Element Occurrences of Ecological Communities
for Parcel A, Lot 33 and Parcel B, Lot 117
Nanoose, BC**

Prepared for:

BC Ministry of Forests

Prepared by:

Helen Reid, B.Sc., R.P.Bio.

**MADRONE ENVIRONMENTAL SERVICES LTD.
1081 Canada Avenue, Duncan, BC V9L 1V2**

March 31, 2006

Dossier 06.0071

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 CONSERVATION ASSESSMENT PROCEDURE	1
2.1 Conservation Assessment Procedure Steps.....	1
2.2 Field Crew	2
2.3 Conducting Field Inspections and Plot Sampling.....	2
3.0 CONSERVATION EVALUATION.....	4
3.1 Conservation Evaluation for Lot 117	4
3.2 Conservation Evaluation for Lot 33	11
4.0 DATA SUBMISSION	18
5.0 REFERENCES	19
APPENDIX I. ELEMENT OCCURRENCE SPECIFICATIONS	20



CONSERVATION ASSESSMENT Element Occurrences of Ecological Communities for Parcel A, Lot 33 and Parcel B, Lot 117 Nanoose, BC

1.0 INTRODUCTION

The purpose of this Conservation Assessment is to identify potential **Element Occurrences (EOs)** and then evaluate and rank **viability** of each occurrence. This Assessment was carried out on two parcels of provincial crown land in the Nanoose area (Figure 1). Parcel A (Lot 33) is located west of the Island Highway off Dufferin and Rena Roads. Parcel B (Lot 117) is located west of the Island Highway off Shooting Star Place.

2.0 CONSERVATION ASSESSMENT PROCEDURE

The Conservation Assessment procedure follows the draft Conservation Assessment Procedure for Element Occurrences of Ecological Communities (BC Ministry of Environment, Draft, 2006).

2.1 Conservation Assessment Procedure Steps

1. Acquired relevant inventory information. For Lot 33, this included TRIM forest cover only. For Lot 117, this included a TEM map and report, *Ecological Inventory of Proposed Woodlot #0030: Nanoose Bay* (Triton Environmental Consultants Ltd., 1998).
2. Acquired tracking lists for all Red- and Blue-listed ecological communities and/or species that are likely to occur within the area in question (CDC website (<http://srmwww.gov.bc.ca/atrisk/toolintro.html>)).
3. Obtained air photo 1994 imagery.
4. Identified ecological communities by air photo interpretation and delineated into polygons.

5. Mapped tentative EOs, using EO Specifications for **separation distance, barriers, landscape context, and size**. EO Specifications are written for each element (see Appendix I). The tentative EOs for these two sites that have EO SPEC associated with them is the plant community Douglas-fir / dull Oregon-grape. This community is found in the site series 01; thus, all polygons mapped as having contained this site series are mapped as tentative EOs.
6. Determined field sampling requirements and organized field sampling plan. This plan involved visiting each polygon and assessing it for ecosystem type, structural stage, soil type, condition, and presence of alien species.
7. Conducted field assessment according to the Field Assessment Methodology in Section 4.0. During the field assessment, plot information was gathered.
8. After the field assessment, all field information was compiled and the EO rank was calculated using the Conservation Evaluation Template (Appendix I).

2.2 Field Crew

Helen Reid, B.Sc., R.P.Bio, TEM Mapper, Madrone Environmental Services Ltd.
Pamela Williams, B.Sc., Bioterrain Mapper, Madrone Environmental Services Ltd.
Mary Jo Hamey, Ecosystem Biologist, BC Ministry of Environment.

2.3 Conducting Field Inspections and Plot Sampling

Field inspections were carried out to verify pretyping of air photos with emphasis being placed in polygons that could potentially contain the red-listed ecological community, Douglas-fir / dull Oregon-grape, *Pseudotsuga menziesii* / *Mahonia nervosa*. Five ground inspections and one visual were done in Lot 117. A full ecosystem plot was not carried out because of the presence of detailed soil information in the 1998 Triton report. One ground inspection (GIF) and five visual inspections were done in Lot 33; because of the close proximity of the two sites, a full ecosystem plot was not carried out on this lot.

Photographs were taken of each plot.

CONSERVATION ASSESSMENT CHECKLIST

Step	Completed	Comments
1. Compile relevant information.	Yes	
2. Determine Red and Blue Listed Communities.	Yes	
3. Obtain imagery.	Yes	
4. Map ecological communities.	Yes	
5. Map EOs if possible.	Yes	
6. Determine if required information has been obtained: a) Ecosystem delineation _____ Yes _____ b) Disturbance History _____ Yes _____ c) Current land use in surrounding area _____ Yes _____ d) Type and extent of invasives _____ Yes _____ e) Current threats _____ Yes _____		
7. If more information needed go to step 8. If enough information go to step 9.		
8. Conduct Field Assessment (i.e., classify site series).	Yes	
9. If no EO present, Assessment is Complete.	EO Present	
10. If EO present, carry out Conservation Evaluation.	Yes	
11. Determine EO rank.	Yes	
12. Submit Information Package to CDC.	Yes	



3.0 CONSERVATION EVALUATION

3.1 Conservation Evaluation for Lot 117

The Conservation Evaluation ranking calculated to 2.28. The site series 01 (DS), which has the potential to contain the Red-listed ecological community Douglas-fir / dull Oregon-grape was mapped in five polygons within this lot. Generally the site series was in a mosaic with site series 05 (RF) and/or 04 (RK). The structural stage of the overall woodlot ranged from between 5 and 7, with a greater portion of 06. The evaluation took into consideration the entire lot with respect to landscape context, while the evaluation was carried out on those polygons containing the site series 01 and summarized them together. Overall, the ecological communities of the stands were good, with very few invasive species present. Holly was the primary invasive. Site features include:

- Numerous older Douglas-fir trees and scattered vets
- Small wetlands
- Well-used recreational trails
- Several creeks
- Diversity of ecosystems
- Small patch of old growth
- Older second growth intact forest
- Few invasive plant species

During the field inspection, a film crew was observed in the process of making a movie.

A BC Hydro right-of-way runs through the lot 117.

See Table 1, Figure 1, and photographs for full Conservation Evaluation for Lot 117.

**Table 1. Conservation Evaluation for Lot 117
(for Douglas-fir / dull Oregon-grape Ecological Community)**

Factor	Components (Rating Specifications)	Justification	Rank (1,2,3 or 4)
Size	<p>A (4) Rating Specs: Very large (> 2000 ha).</p> <p>B (3) Rating Specs: Large (200–2000 ha).</p> <p>C (2) Rating Specs: Moderate (8–200 ha).</p> <p>D (1) Rating Specs: Small (< 8 ha).</p>	Size between 8–200 ha	2
Condition	<p>A (4) Rating Specs:</p> <p>a) Typically an old-growth forest.</p> <p>b) Structure is all-aged with multi-layered canopy.</p> <p>c) Large diameter trees >1 m dbh are present.</p> <p>d) Well developed, vertical structure, created by shrubs and trees in multilayers.</p> <p>e) Standing (snags) and fallen (coarse woody debris) dead and decaying wood of all sizes and diameters are present.</p> <p>f) At least ½ of occurrence has stand age >250 years or multi-cohort stand with significant component greater >250 year old trees.</p> <p>g) No or very little evidence of past forest harvesting.</p> <p>h) Understorey vegetation composed of native species</p> <p>i) Alien species absent or non-invasive and present with low frequency.</p> <p>j) Evidence of natural disturbance (i.e., fire) may be present.</p> <p>k) No mineral soil exposure due to recreation or resource use.</p> <p>l) No livestock grazing evident.</p> <p>B (3) Rating Specs:</p> <p>a) Typically a mature or nearly mature forest.</p> <p>b) Vertical structure, created by shrubs and by tree species in at least two layers and age classes.</p> <p>c) Remnant large diameter trees may be present.</p> <p>d) Some standing and fallen dead and decaying wood present of varying diameters.</p> <p>e) Little to no evidence of past forest harvesting over a major proportion of the occurrence and majority of stands are <250 years of age or majority of stands >250 years of age but show evidence of selective logging that has altered their structure.</p> <p>f) Stand origin may be fire, geomorphological event or windfall event.</p> <p>g) Understorey vegetation composed of native species.</p> <p>h) Alien species may be present with low to moderate frequency, or invasive alien species present but have low percent over.</p> <p>i) No or minimal mineral soil exposure due to recreation or resource use.</p> <p>j) Livestock grazing minimal.</p>	<p>– Previous logging mostly selective.</p> <p>– One stand is structural stage 7 (either left behind from previous logging 70 years ago, or not logged at all).</p> <p>– Very few non-native species (some holly).</p> <p>– Most of the forest ranged in structural stage from 5 to 6.</p> <p>– Well-developed vertical structure</p> <p>– Abundant Course woody debris in a variety of diameters.</p> <p>– Understorey vegetation composed of native vegetation.</p>	3



Factor	Components (Rating Specifications)	Justification	Rank (1,2,3 or 4)
	<p>C (2) Rating Specs</p> <ul style="list-style-type: none"> a) Vertical structure poorly developed, mostly even aged stand, well-developed shrub layer. b) young to mature stands (<100 yrs) stands regenerated naturally after logging or with significant history of selective logging disturbance that altered composition or structure. c) Standing and fallen dead and decaying wood mainly of small diameter. d) Invasive alien species may be uncommon to frequent but do not dominate or co-dominate understorey (<10–20% cover). e) Heavy grazing by livestock, altered ground layer composition. f) Areas of exposed mineral soil may be present. <p>D (1) Rating Specs</p> <ul style="list-style-type: none"> a) Invasive alien species abundant in the understorey. b) Stand typically regenerated after forest harvesting; with almost no understorey development (may be moss layer only). c) Dominant trees were planted (and potentially non-local genetic stock). d) Ground very disturbed with major disruptions to vegetation and areas of exposed mineral soil. e) Continued resource extraction or intense recreational use ongoing. f) Evidence of heavy grazing history and possibly ongoing. 		
<p>Landscape Context</p>	<p>A (4) Rating Unfragmented (<5). EO surrounded by large area of intact natural vegetation (>800 ha), with species interactions and natural processes occurring across communities. Few small roads in the surrounding landscape.</p> <p>B (3) Rating Partly fragmented (5–25%) of landscape composed of at least 80% natural or seminatural vegetation, with any development occurring not directly adjacent to the occurrence; or landscape has very little development or agriculture, but has major components of alien vegetation in at least one physiognomic layer or is composed primarily of young tree plantations.</p> <p>C (2) Rating Specs Partly fragmented (25–35% of landscape is a mosaic of agricultural or semi-developed areas and natural or semi-natural vegetation composes 25–80% of the landscape or landscape is dominated by very young tree plantations (cut within the last 20 years).</p> <p>D (1) Rating Specs Highly fragmented (>35% of landscape is mosaic of agricultural or semi-development, or urban) – Occurrence surrounded primarily by urban or agricultural landscape with <35% landscape cover of natural or seminatural vegetation.</p>	<p>EO is partly fragmented (25–35%) by adjacent recent logging and by adjacent rural residences.</p>	<p>2</p>

Calculated EO Rank based on:

Primary factor (Size) (44%) = X

Secondary factor (Condition) (28%) = Y

Tertiary factor (Landscape Context) (28%) = Z

Rank Calculation:

(Primary factor * 3) + (Secondary Factor * 3 + Tertiary Factor * 2 = EO Rank

(0.44 * 2) + (0.28 * 3 + (0.28 * 2) = EO Rank

.88 + .84 + .56 = 2.28 EO Rank

Figure 1. EO Rank Calculation for Lot 117, Douglas-fir / dull Oregon-grape.



PHOTOGRAPHS FOR LOT 117



Plot Number N1.
Site Series 01,
structural stage 6.
Located on the
northern portion of
the Lot. Some site
series 04 scattered,
throughout this
stand (<10%).

Plot Number N2.
Site Series 06, structural stage 5–6.
Adjacent to this stand is a very wet
site, most likely a fluctuating water
table.





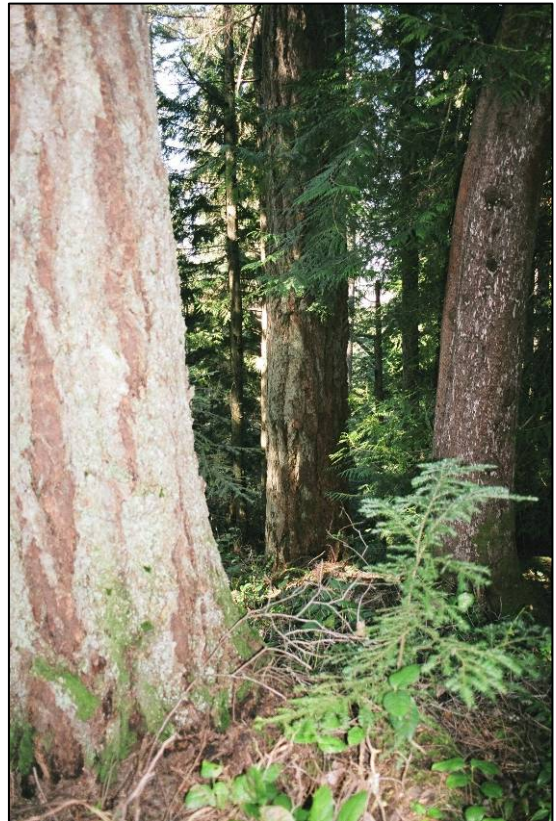
Plot Number N3.
Site Series 05, structural stage 6. Note fairly well developed vertical structure.

Plot Number N3.
Site Series 05, structural stage 6.



Plot Number N4.
Site Series 01, structural stage 7
Large old vet amongst a group of vets.

Plot Number N5.
Site Series 01, structural stage 6.
Note large Douglas-fir trees.



**Trail between plot
N5 and N6, where
movie was being
filmed.**

Actors can be seen on
the left-hand side of
trail.



Plot Number N6.
Site series 01,
structural stage 6.
Fairly open, with
large scattered
Douglas-firs
present.

3.2 Conservation Evaluation for Lot 33

The conservation Evaluation ranking for Lot 33 calculated to 2.28. The site series 01 (DS), which has the potential to contain the Red-listed ecological community Douglas-fir / dull Oregon-grape was mapped in six polygons within this lot. Two of these polygons contained primarily site series 01 only, while four polygons were mosaics with the wetter richer site series 05 (RF). The structural stage of the overall lot ranged 5 and 7. The evaluation took into consideration the entire lot for landscape context, while the conservation evaluation was carried out on all polygons containing the site series 01 and summarized together. Overall, the condition of the stands was good, with very few invasive species present. Holly was the primary invasive.

Features of this site include:

- Numerous older Douglas-fir trees and scattered vets.
- A relatively large concentration of older Douglas-fir trees (structural stage 7).
- A wetland located in the northwestern portion of the lot.
- A relatively large depression area located in the southwesterly portion, (mapped as a fluctuating water table, site series 14).

This lot contained a well-used trail used by the community for recreational purposes, primarily hiking. This trail is connected to a series of extensive trails used by the community.

See Table 1, Figure 2, and photographs for full Conservation Evaluation for Lot 117.

Table 2. Conservation Evaluation for Lot 33 (for Douglas-fir / dull Oregon-grape Ecological Community)

Factor	Components (Rating Specifications)	Justification	Rank (1,2,3 or 4)
Size	<p>A (4) Rating Specs: Very large (> 2000 ha).</p> <p>B (3) Rating Specs: Large (200–2000 ha).</p> <p>C (2) Rating Specs: Moderate (8–200 ha).</p> <p>D (1) Rating Specs: Small (< 8 ha).</p>		2
Condition	<p>A (4) Rating Specs:</p> <p>a) Typically an old-growth forest.</p> <p>b) Structure is all-aged with multi-layered canopy.</p> <p>c) Large diameter trees >1 m dbh are present.</p> <p>d) Well developed, vertical structure, created by shrubs and trees in multilayers.</p> <p>e) Standing (snags) and fallen (coarse woody debris) dead and decaying wood of all sizes and diameters are present.</p> <p>f) At least ½ of occurrence has stand age >250 years or multi-cohort stand with significant component greater >250-year-old trees.</p> <p>g) No or very little evidence of past forest harvesting.</p> <p>h) Understorey vegetation composed of native species.</p> <p>i) Alien species absent or non-invasive and present with low frequency.</p> <p>j) Evidence of natural disturbance (i.e., fire) may be present.</p> <p>k) No mineral soil exposure due to recreation or resource use.</p> <p>l) No livestock grazing evident.</p> <p>B (3) Rating Specs:</p> <p>a) Typically a mature or nearly mature forest.</p> <p>b) Vertical structure, created by shrubs and by tree species in at least two layers and age classes.</p> <p>c) Remnant large diameter trees may be present.</p> <p>d) Some standing and fallen dead and decaying wood present of varying diameters.</p> <p>e) Little to no evidence of past forest harvesting over a major proportion of the occurrence and majority of stands are <250 years of age or majority of stands >250 years of age but show evidence of selective logging that has altered their structure.</p> <p>f) Stand origin may be fire, geomorphological event or windfall event.</p> <p>g) Understorey vegetation composed of native species</p> <p>h) Alien species may be present with low to moderate frequency, or invasive alien species present but have low percent over.</p> <p>i) No or minimal mineral soil exposure due to recreation or resource use.</p> <p>j) Livestock grazing minimal.</p>	<p>– Mostly mature forest</p> <p>– Previous logging mostly selective.</p> <p>– Few non-native species (some holly).</p> <p>– Most of the forest ranged in structural stage from 5 to 6, with some interspersed older trees and vets.</p> <p>– Generally well-developed vertical structure.</p>	3



Factor	Components (Rating Specifications)	Justification	Rank (1,2,3 or 4)
	<p>C (2) Rating Specs</p> <ul style="list-style-type: none"> a) Vertical structure poorly developed, mostly even aged stand, well-developed shrub layer. b) young to mature stands (<100 years); stands regenerated naturally after logging or with significant history of selective logging disturbance that altered composition or structure. c) Standing and fallen dead and decaying wood mainly of small diameter. d) Invasive alien species may be uncommon to frequent but do not dominate or co-dominate understorey (<10–20% cover). e) Heavy grazing by livestock, altered ground layer composition. f) Areas of exposed mineral soil may be present. <p>D (1) Rating Specs</p> <ul style="list-style-type: none"> a) Invasive alien species abundant in the understorey. b) Stand typically regenerated after forest harvesting, with almost no understorey development (may be moss layer only). c) Dominant trees were planted (and potentially non-local genetic stock). d) Ground very disturbed with major disruptions to vegetation and areas of exposed mineral soil. e) Continued resource extraction or intense recreational use ongoing. f) Evidence of heavy grazing history and possibly ongoing. 		
<p>Landscape Context</p>	<p>A (4) Rating Unfragmented (<5). EO surrounded by large area of intact natural vegetation (>800 ha), with species interactions and natural processes occurring across communities. Few small roads in the surrounding landscape.</p> <p>B (3) Rating Partly fragmented (5–25%) of landscape composed of at least 80% natural or seminatural vegetation, with any development occurring not directly adjacent to the occurrence; or landscape has very little development or agriculture, but has major components of alien vegetation in at least one physiognomic layer or is composed primarily of young tree plantations.</p> <p>C (2) Rating Specs Partly fragmented (25–35% of landscape is a mosaic of agricultural or semi-developed areas and natural or seminatural vegetation composes 25–80% of the landscape or landscape is dominated by very young tree plantations (cut within the last 20 years).</p> <p>D (1) Rating Specs Highly fragmented (>35% of landscape is mosaic of agricultural or semi-development, or urban) – Occurrence surrounded primarily by urban or agricultural landscape with <35% landscape cover of natural or seminatural vegetation.</p>	<p>Eastern and northern boundary has rural development (25-35% of landscape semi-developed)</p>	<p>2</p>

Calculated EO Rank based on:

Primary factor (Size) (44%) = X

Secondary factor (Condition) (28%) = Y

Tertiary factor (Landscape Context) (28%) = Z

Calculated Rank:

(Primary factor * 2) + (Secondary Factor * 3) + Tertiary Factor * 2) = **EO Rank**

(0.44 * 2) + (0.28 * 3) + (0.28 * 2) = **EO Rank**

0.88 + 0.84 + 0.56 = 2.28

Figure 2. EO Rank Calculation for Lot 33, Douglas-fir / dull Oregon-grape.

PHOTOGRAPHS FOR LOT 33

Plot Number N7a.
Site Series 01, structural
stage 5. Fairly open, with
interspersed rocky openings.



Plot N8.
Site Series 01, structural
stage 5. Drier site than plot 7a.
Note the large moss- and
herb-covered rocky openings.

Plot Number N9.
Site Series 01, structural
stage 6–7. Fairly extensive area
with large old Douglas-fir.





Plot Number N11.
Site Series 06, structural stage 5–6. Fairly open stand with some large Douglas-fir vets and large Western Redcedar.

Plot Number 12.
Site Series 01, structural Stage 06. Note large Douglas-fir vet.



Adjacent to Plot Number 12.
Site Series 06, structural stage 6. This polygon is comprised of 50% site series 01 and 50% site series 06.

4.0 DATA SUBMISSION

After completing the Conservation Assessment, all information was then submitted to the MoF for review. The information submitted included:

- Air photo with polygon(s) showing EO and TEM mapping. All polygons were labeled and EOs were labeled as site series DS (01).
- Plot card information.
- Photographs of EOs and surrounding area.
- Conservation Evaluation
- Report by Triton Environmental Consultants

5.0 REFERENCES

BC Ministry of Environment. 2006. Conservation Assessment Procedure for Element Occurrences of Ecological Communities. Draft Report.

CDC website (<http://srmwww.gov.bc.ca/atrisk/toolintro.html>)

Green, R.N., and K. Klinka. 1994. *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region*. Land Management Handbook #28, Ministry of Forests, Research Branch, Victoria, BC.

Resource Inventory Committee (RIC). 1998a. *Field Manual for Describing Terrestrial Ecosystems*. Co-published by the Min. of Forests and Min. of Environment. Prov of BC, Victoria, BC.

Triton Environmental Consultants Ltd., March 1998. Ecological Inventory of Proposed Woodlot #0030: Nanoose Bay. Prepared for BC Ministry of Environment, Lands and Parks, Nanaimo, BC.

Prepared by:

Helen Reid, B.Sc., R.P.Bio.

APPENDIX I. ELEMENT OCCURRENCE SPECIFICATIONS

Element Occurrence Specifications for:

Pseudotsuga menziesii / *Mahonia nervosa* Douglas-fir / dull Oregon-grape

Coastal Douglas-fir moist, maritime (CDFmm) subzone Douglas-fir / dull Oregon-grape (01) site series (*Pseudotsuga menziesii* / *Mahonia nervosa*) is a matrix community type. This community formed the matrix in much of the Coastal Douglas-fir biogeoclimatic zone at presettlement times. Accessible areas have been harvested at least once in the intervening years, either as clearcut operations or selectively harvested for specific trees or species within a stand. No true old forest occurrences are known. Remnants of varying sizes, representing nature and younger forests with patches of old veteran trees do occur. Larger patches of younger forest originating from fire or harvesting occur.

MINIMUM SIZE: 2 ha.

SEPARATION DISTANCES

If stands are separated by cultural vegetation, including clearcuts or tree plantations ≥ 0.5 km wide, major highways, urban development, or large bodies of water, then this separation becomes a substantial barrier to natural processes or species movement (Fuller 2004, NatureServe 2002, RISC 2004). A different natural community wider than 1 km if the communities do not frequently occur in a mosaic or 2 km if the communities frequently occur together in a mosaic.

Justification

Occurs naturally in a mosaic much of the time so minor breaks or small barriers are probably a very common part of the natural distribution and variability. If the breaks are larger, barriers may exist for some species.

RANK PROCEDURE

The primary factor is Size, the secondary factor is Condition, and the tertiary factor is Landscape Context, with secondary and tertiary factors weighted equally. Typically, matrix ecosystems are rated with size as the primary factor and condition as the tertiary factor. European settlement and resource activity has heavily impacted the matrix forest, particularly on Vancouver Island and in the lower Fraser Valley. Consequently, large contiguous element occurrences are no longer present; nor is an unmodified landscape. For this reason, Condition factors, particularly vegetation and structural stage development, carry a premium value and priority of condition is weighted equally to landscape context (Cadrin, 2005). Weighing of factors are as follows (see Table 1 for Conservation Evaluation Template):

Primary factor (Size) (44%) = X
Secondary factor (Condition) (28%) = Y
Tertiary factor (Landscape Context) (28%) = Z

To Calculate Rank:

(Primary factor * X) + (Secondary Factor * Y) + Tertiary Factor * Z = EO Rank
(0.44 * X) + (0.28 * Y) + (0.28 * Z) = EO Rank

SIZE SPECS

A – rated size: Very large (>2000 ha)
B – rated size: Large (200–2000 ha)
C – rated size: Moderate (8–200 ha)
D – rated size: Small (<8 ha)

Justification for AA@-rated criteria: Large enough to provide breeding habitat for woodpeckers (Mellen et al., 1992). Large enough to support a mosaic of stand conditions, ages, and disturbance patterns.

Justification for AC/D@ threshold: Larger than this is the apparent minimum size needed (at the stand level) for breeding varied thrushes or brown creepers, two area-sensitive bird species (Brooks 1978, McGarigal and McComb 1995, Manuwal and Pearson 1997). Smaller is subject to edge effects. No opportunity for mosaic disturbance patterns.

CONDITION SPECS

A – rated condition: At least ½ of occurrence has stand age 250 years (Parminter, 1995) or multicohort stage >250 year old trees (>25/ha) (Franklin and Spies 1984). Structure is all-aged with multilayered canopy. Well-developed, vertical structure, created by shrubs and trees in multilayers. No or very little evidence of past logging disturbance. Non-native species are absent or present with very low frequency, and the understorey vegetation is composed of native species. There may be evidence of natural disturbance (i.e., fire). Typically there is no mineral soil exposure and no livestock grazing.

B – rated condition: Little to no evidence of past logging disturbance over a major proportion of the occurrence; and majority of stands are <250 years of age, or majority of stands >250 years of age but show evidence of selective logging that has altered their structure. Non-native species may be present with low to moderate frequency, but have low percent cover. Typically a mature or nearly mature forest. Well developed, vertical structure, created by shrubs and trees in multilayers. Minimal livestock grazing.

C – rated condition: Stands regenerated naturally after logging, or young to mature stands with significant history of selective logging disturbance that altered composition or structure. Vertical structure poorly developed, mostly even-aged stand, well-developed shrub layer. Non-native species may be uncommon to frequent but do not dominate or codominate understorey (<10–20% cover). Potentially heavy grazing by livestock resulting in an altered ground layer composition.

D – rated condition: Non-native species abundant in the understorey, or dominant trees were planted. Stand typically regenerated after logging. Heavily logged perhaps to the point of clearcut, and thinned and spaced. The occurrence heavily impacted by human disturbance. The ground is very disturbed with major disruptions to vegetation and possible exposed mineral soil.

Justification for AA@-rated criteria: Frequency of old growth stands is extremely low in the CDFmm, so old growth carries a premium for condition. Communities little altered by logging. Non-native species with low threat of spread. The Blue-listed red-legged frog is known to do poorly in clearcuts and is more abundant in older aged stands than in younger stands (British Columbia Ministry of Water, Land and Air Protection, 2004).

Justification for AC/D@ threshold: Factors including such non-native vegetation stock, soil removal, and invasive species can result in the inability of vegetation development. Plantations typically do not have native genetic stock so considered nonrestorable.

LANDSCAPE CONTEXT SPECS

A – rated landscape context: Highly connected – Large area around the EO with intact natural vegetation (>800 ha), with species interactions and natural processes occurring across communities. Few small roads in the surrounding landscape (Chapell et al., 2004).

B – rated landscape context: Moderately connected – Landscape composed of at least 80% natural or seminatural vegetation, with no development occurring; not directly adjacent to the occurrence; or landscape has very little development or agriculture, but has major components of non-native vegetation in at least one physiognomic layer or is composed primarily of young tree plantations.

C – rated landscape context: Moderately fragmented – Landscape is a mosaic of agricultural or semideveloped areas, and natural or seminatural vegetation composes 25–80% of the landscape, or landscape is dominated by very young tree plantations (cut within the last 20 years).

D – rated landscape context: Heavily fragmented – Occurrence surrounded primarily by urban or agricultural landscape with <25% landscape cover of natural or seminatural vegetation.

Justification for AA@-rated criteria: Connectivity intact. Natural processes can function.

Justification for AC/D@ threshold: Landscape connectivity seriously impacted below about 35% cover of natural/seminatural vegetation.

AUTHORSHIP: Helen Reid

DATE: February 6, 2006



British Columbia Ministry of Water, Land and Air Protection. 2004. Red-Legged Frog in Accounts and Measures for Managing Identified Wildlife. Accounts V. 2004. Biodiversity Branch, Identified Wildlife Management Strategy, Victoria, BC. Available: <http://www.env.gov.bc.ca/wld/identified/accounts.html> (accessed February 15, 2006).

Cadrin, Carmen, 2005. Conservation Evaluation of Woodlot 0013, Nanoose, BC. Unpublished report. Province of BC, Victoria, BC.

Chappell, Chris and C. Cadrin, 2003. Draft Element Occurrence Specifications for *Pseutsuga menziesii* / *Mahonia nervosa* Douglas-fir / dull Oregon-grape. Victoria, BC.

Chappell, C., J. Christy and E. Alverson. 2004. Terrestrial Ecological System Element Occurrence Specifications and Element Occurrence Rank Specifications: Appendix 11 *In: Floberg, J., M. Goering, G. Wilhere, C. MacDonald, C. Chappell, C. Rumsey, Z. Ferdana, A. Holt, P. Skidmore, T. Horsman, E. Alverson, C. Tanner, M. Bryer, P. Iachetti, A. Harcombe, B. McDonald, T. Cook, M. Summers, and D. Rolph. Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, Volume One: Report. Prepared by The Nature Conservancy with support from the Nature Conservancy of Canada, Washington Department of Fish and Wildlife, Washington Department of Natural Resources (Natural Heritage and Nearshore Habitat programs), Oregon State Natural Heritage Information Center and the British Columbia Conservation Data Centre.*

Fuller, R. 2004. Assessment of Crown Land Parcels. Prepared for Ministry of Water, Land and Air Protection. Nanaimo, BC. March 2004.

Franklin, J.F., and T.A. Spies. 1984. Characteristics of old-growth Douglas-fir forests. Pages 328–334 *In: Proceedings, Soc. of American Foresters national convention, Oct. 16–20, 1983. Soc. of American Foresters, Washington, DC.*

Manuwal, D. A., and S. Pearson. 1997. Bird populations in managed forests in the western Cascade Mountains, Washington. *In: Wildlife use of managed forests: a landscape perspective. Vol. 2, West-side research studies.*



McGarigal, K., and W. C. McComb. 1995. Relationships between landscape structure and breeding birds in the Oregon Coast Range. *Ecol. Monographs* 65:235–260.

Mellen, T.K., E.C. Meslow, and R.W. Mannan. 1992. Summertime home range and habitat use of pileated woodpeckers in western Oregon. *J. Wildlife Management* 56:96–103.

NatureServe. 2002. Element Occurrence Data Standards. NatureServe in cooperation with the Network of Natural Heritage Programs and Conservation Data Centres.

Parminter, J. (co-editor). 1995. Biodiversity Guidebook. Forest Practices Code of British Columbia. British Columbia Ministry of Forests and Ministry of Environment, Lands and Parks. Victoria, BC. Ix + 99 p.

RISC. Resource Inventory Standards Committee. January 2005 draft. Standards for Mapping Ecosystems at Risk and other Sensitive Ecosystems. Province of BC, Victoria, BC.

Willamett Valley – Puget Trough – Georgia Basin Ecoregional Assessment. March 2004. The Nature Conservancy.