

**HORSEFLY RIVER WATERSHED**  
**Watershed Restoration Program - Cariboo Region**

**Wetland/Riparian/Terrestrial Habitat Assessment**

**BIODIVERSITY ASSESSMENT (Part B)**

**DRAFT REPORT**

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## TABLE OF CONTENTS

### 1.0 Introduction

### 2.0 Watershed Characteristics

### 3.0 Results and Discussion

- 3.1. SUBUNIT #1 - Upper Horsefly River above Mackay River
- 3.2. SUBUNIT #2 - Middle Horsefly River above the Falls
- 3.3. SUBUNIT #3 - Lower McKusky Creek
- 3.4. SUBUNIT #4 - MacKay River
- 3.5. SUBUNIT #5 - Upper McKusky Creek
- 3.6. SUBUNIT #6 - Upper McKusky Creek
- 3.7. SUBUNIT #7 - Upper McKusky Creek
- 3.8. SUBUNIT #8 - Upper McKinley Creek
- 3.9. SUBUNIT #9 - Upper McKinley Creek
- 3.10. SUBUNIT #10 - Upper McKinley Creek
- 3.11. SUBUNIT #11 - Middle McKinley Creek
- 3.12. SUBUNIT #12 - Molybdenite (McKinley) Creek
- 3.13. SUBUNIT #13 - Lower McKinley Creek
- 3.14. SUBUNIT #14 - Horsefly River (Doreen Creek)
- 3.15. SUBUNIT #15 - Middle Horsefly River above Little Horsefly River.
- 3.16. SUBUNIT #16 - Tisdall Creek
- 3.17. SUBUNIT #17 - Moffat Creek
- 3.18. SUBUNIT #18 - Woodjam Creek
- 3.19. SUBUNIT #19 - Woodjam Creek
- 3.20. SUBUNIT #20 - Woodjam Creek
- 3.21. SUBUNIT #21 - Moffat Creek

### 4.0 Summary

### 5.0 Appendices

- 5.1 Appendix 1: Biodiversity Summary Table
- 5.2 Appendix 2: Complete Biodiversity Database by Subunit

## HORSEFLY RIVER WATERSHED

### **BIODIVERSITY ASSESSMENT**

#### 1.0 INTRODUCTION

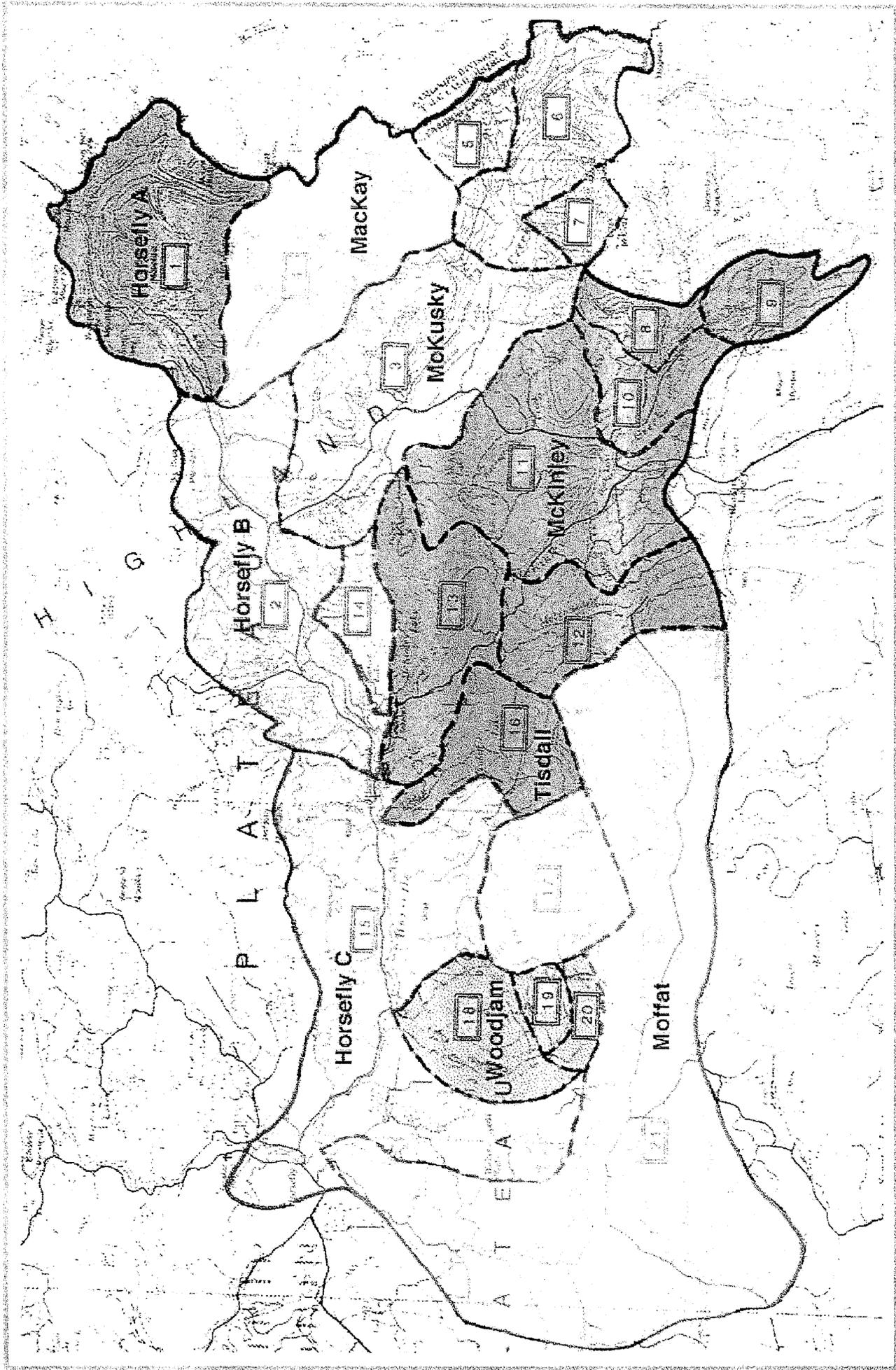
Through a contract with the Ministry of Environment, Lands & Parks (MOELP) under the Watershed Restoration Program of Forest Renewal British Columbia (FRBC), AIM Ecological Consultants Ltd. and their associates undertook a comprehensive assessment of the Horsefly River Watershed. The project included:

- (1) Level 1 Watershed Assessment (IWAP)
- (2) Sediment Source Inventory and Mapping
- (3) Review of Horsefly Monitoring Program, and
- (4) Riparian, Wetland and Terrestrial Habitat Assessment

This report addresses the biodiversity component of the Riparian, Wetland and Terrestrial Habitat Assessment. The Horsefly River Watershed Biodiversity Assessment is based on the 21 subunits developed for the purposes of the IWAP (Interior Watershed Assessment Procedure) completed by Dobson Engineering Ltd. in March 1996. Figure 1 shows the boundaries of the 21 subunits or subbasins which make up the Horsefly River watershed upstream of the Little Horsefly River. Appendix 1 summarizes the biodiversity information used for this report. The seral stage computations for this biodiversity assessment were completed by Inland Timber using Ministry of Forests data. This information appears in the attached Appendix 2.

The Forest Practices Code of British Columbia publication "Biodiversity Guidebook" (September 1995) identifies biodiversity objectives for the province based on five natural disturbance types (NDT's). Within each natural disturbance type, seral stage objectives (forest ages) have been established for the various biogeoclimatic subzones and variants. Recommended or target seral stage distributions (in percent cover) for each biogeoclimatic unit occurring in the NDT is presented in tabular form with objectives identified for each of three biodiversity emphasis options (low, intermediate, and high). The intermediate biodiversity emphasis option was used for the following biodiversity analysis.

The objective of this biodiversity analysis is to assess whether old growth and forest seral stage targets are being met in the various subunits of the watershed. Information regarding the seral stage composition of known mule deer winter ranges within the subunits was analysed separately to allow determination of potential impacts on wildlife habitat based on seral stage data.



Horsefly River Watershed Sub-basins

## 2.0 WATERSHED CHARACTERISTICS

The watershed of the Horsefly River is located on the eastern edge of the Interior Plateau, in southcentral British Columbia. The Horsefly River watershed, above the Little Horsefly River, covers an area of 213,800 hectares. The eastern portions of the watershed are mountainous, and abut the western boundary of Wells Gray Provincial Park. The western portions of the Horsefly River watershed are characterized by lowlands with extensive wetland areas present.

As part of the IWAP conducted for the overall Horsefly River watershed assessment, the watershed was divided into 21 subunits or subbasins. The areas of these subunits appear in the following table (Table 1). These subunits form the basis for the biodiversity assessment.

**Table 1. Horsefly River Watershed Subunit Areas**

<b>Sub-Basin</b>	<b>Area (sq. km)</b>	<b>Sub-Basin</b>	<b>Area (sq. km)</b>
1	145	12	80
2	169	13	77
3	184	14	20
4	144	15	238
5	29	16	71
6	74	17	74
7	20	18	64
8	26	19	13
9	40	20	13
10	42	21	483
11	180	<b>TOTAL</b>	<b>2138</b>

### 3.0 RESULTS AND DISCUSSION

Excluding NDT5 (Alpine Tundra), which does not have defined seral stages, there are three natural disturbance types (NDT's 1,2,&3), representing five different NDT/biogeoclimatic zone combinations in the watershed study area. The following table shows both the total number of subunits in which each NDT variant occurs, and the percentage of the total number of subunits (21) in the watershed.

NDT	BGCZ	Number of subunits occurs in	Percentage of total subunits (21)
1	ESSF	21	100 %
1	ICH	9	43 %
2	ICH	10	48 %
3	SBPS	4	19 %
3	SBS	9	43 %

NDT1 (ESSF) is the most widely occurring biogeoclimatic type, appearing in all 21 subunits in the watershed study area. Three other variants (NDT1-ICH, NDT2-ICH, and NDT3-SBS) are found in slightly less than half of the subunits. NDT3 (SBPS) has the narrowest distribution, occurring in only 19% of all the subunits.

The following table shows the percentage of watershed subunits in which the actual seral stage components do not meet the recommended levels for the intermediate biodiversity option under the Forest Practices Code. Within the mature plus old and old growth seral stages, the figures represent the percentage of the total number of subunits, excluding subunits which consist entirely of mule deer winter range areas, which have less than the FPC recommended minimum levels for these age classes. For example, within NDT1 (ESSF) in the old growth seral stage we see that 84.2% of the subunits with this forest cover type have less than the FPC recommended guidelines. For the early seral stage component, the percentage figure indicates the proportion of the non-mule deer winter range subunits having more than the FPC recommended maximum level.

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	36.8 %	21 %	84.2 %
1	ICH	62.5 %	50 %	62.5 %
2	ICH	11 %	44.4 %	66.6 %
3	SBPS	0 %	25 %	50 %
3	SBS	0 %	62.5 %	87.5 %

Within the 213,800 hectare Horsefly River study area, that is to say that portion of the watershed upstream of the Little Horsefly River, the amount of old growth forest remaining in each of the biogeoclimatic zones fails to meet FPC recommended guidelines for the intermediate biodiversity emphasis option in at least half of the subbasins. Old growth forests in the NDT1 (ESSF) and NDT3 (SBS) biogeoclimatic zones exhibit the greatest departures from FPC targets, with over 80% of the subbasins with these forest types being below FPC seral stage targets. With respect to early seral stage distributions nearly two-thirds of the subbasins with NDT1 (ICH) forest cover have excessive early seral stage growth according to FPC guidelines.

Six of the 21 watershed subunits in the Horsefly River study area have mule deer winter range areas inside their boundaries. Two of these subunits (Subunits #14 and #20) are located entirely within mule deer winter ranges. The following table shows the percentage of watershed subunits, with mule deer winter range areas inside their boundaries, in which the actual seral stage components do not meet the recommended FPC levels.

MULE DEER WINTER RANGE SUBUNITS

<b>NDT</b>	<b>BGCZ</b>	<b>EARLY</b>	<b>MATURE &amp; OLD</b>	<b>OLD</b>
<b>1</b>	<b>ESSF</b>	<b>40%</b>	<b>100%</b>	<b>100%</b>
<b>1</b>	<b>ICH</b>	<b>0%</b>	<b>0%</b>	<b>100%</b>
<b>2</b>	<b>ICH</b>	<b>25%</b>	<b>75%</b>	<b>75%</b>
<b>3</b>	<b>SBPS</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
<b>3</b>	<b>SBS</b>	<b>0%</b>	<b>100%</b>	<b>100%</b>

NDT1 (ESSF) old growth forest is found in five of the six subunits with mule deer winter range present. In the mule deer winter range areas of all five of these subunits (i.e. 100% of the subunits) the amount old growth ESSF is less than the recommended FPC minimum. Similarly, old growth percentage composition does not meet the recommended targets in any of the NDT1 (ICH) and NDT3 (SBS) mule deer winter range areas in the watershed. Mature plus old targets are also not being met in any of the NDT1 (ICH) and NDT3 (SBS) mule deer winter range areas, and in only 1 of the 4 subunits with NDT2 (ICH) mule deer winter range.

### 3.1. SUBUNIT #1 - Upper Horsefly River above Mackay River

Subunit 1 is the Horsefly River watershed upstream of the MacKay River. It has an area of 141 square kilometers. Much of this subbasin is characterized by very mountainous terrain. Forest harvesting development is not extensive and has thus far been confined to the lower portions of the watershed. Of the 93 sediment sources identified in a related study only 16% (ie. 15 sites) were identified as forestry-related, while the rest (84% or 78 sites) were from natural sources. There are no mule deer winter ranges in this subunit.

With respect to biodiversity, the following table of actual and FPC target seral stage distributions indicates that most of this subunit consists of mature and old seral stages (91%) with only a small proportion (7%) in early seral stages.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	7 (<22)	91 (>36)	7 (>19)
5	AT	0	0	0

Of the two natural disturbance types (NDT1 and 5) in this subunit, NDT5 (Alpine Tundra) represents only 5% of the total forested area. Within NDT1 (ESSF) only the climax or old seral stage falls short of the recommended minimum requirement of >19%. This old seral stage objective can be reached over time, by allowing portions of the mature component to age further.

### 3.2. SUBUNIT #2 - Middle Horsefly River above the Falls

This subunit is a face unit of the mainstem Horsefly River and is comprised of a number of small drainages which flow directly into the Horsefly River between the MacKay River and McKinley Creek.

The surface area is 168.5 square kilometers. This sub-unit falls within two separate Landscape Units, the draft boundaries of which were changed after this study was initiated.

Forest development is widespread throughout this subbasin. A recently completed sediment source inventory for the Horsefly River watershed identified 138 sediment sources in this subbasin, 77% (106 of 138) of which are man-made, with all but one (i.e. 105 of 106 sediment sources) associated with forest development.

Subbasin 2 has a total forested area of 15856 hectares, with 1.7% (271 ha.) within known mule deer winter ranges. In terms of biodiversity, the following table of actual and FPC target seral stage distributions indicates that most of this subunit, not including the mule deer winter range area, consists of early seral stages with relatively little old seral stage growth remaining.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	55 (<22)	48 (>36)	5 (>19)
1	ICH	77 (<30)	20 (>34)	1 (>13)
2	ICH	87 (<66)	3 (>31)	1 (>9)
3	AT	0	0	0

Of the three natural disturbance types (NDT1,2 and 5) in this subunit, NDT5 (Alpine Tundra) represents less than 1% of the total forested area. Early seral stages are overrepresented in this unit at present.

Within NDT1 (ESSF) both the early and the old seral stages do not meet the recommended targets. Only the mature plus old category is presently within FPC guidelines. The old seral stage minimum requirement of >19% can be reached over time by allowing portions of the mature component to age further.

Within NDT1 (ICH) none of the seral stage percentages are within the targets and it will be some time before the early seral stage areas mature into the older categories. Old growth targets can be met in the future by allowing most of the existing mature cover to reach climax conditions.

Within NDT2 (ICH) the seral stage percentages are well outside the target percentages. It will be a considerable length of time before the early seral stage areas mature into the older categories as the mid-seral stage (between early and mature) is only a small portion (10%) of the total forested area in NDT2 at present. Old growth targets can only be met in the future through careful planning and retention of existing mature and old forests.

The 271 ha of mule deer winter range in this subbasin are found within two natural disturbance types (NDT1&2), and the seral stage distributions of these are as follows:

MULE DEER WINTER RANGE

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	3 (<22)	17 (>36)	10 (>19)
2	ICH	7 (<36)	6 (>31)	0 (>9)

Most of the mule deer winter range in this subunit (211 ha or 78%) occurs within NDT2 (ICH), and NDT 1 (ESSF) represents only 22% of the total mule deer winter range area. Within both natural disturbance types, the mature plus old and old seral stages fall short of the recommended minimum requirements. Because the mid-seral stage covers 86% (233 ha) of the mule deer winter range area, these mature and old seral stage objectives may be reached over time by allowing portions of the mid-seral stage component to age. It is interesting to note that the seral stage distributions of the mule deer winter range are very different from the seral stage distributions of the rest of the subunit, with the mid-seral stages covering only 6% of the non-winter range area and 86% of the mule deer winter range..

### 3.3. SUBUNIT #3 - Lower McKusky Creek

Subunit 3 includes all of the lower watershed of McKusky Creek between its confluence with the Horsefly River and the point where McKusky Creek flows into Crooked Lake. It thus includes several small creek drainages which flow directly into Crooked Lake. The surface area of subunit 3 is 184 square kilometers.

Most of the forest development activity in this subbasin has occurred along the lower portions of McKusky Creek with more recent activity along the western side of Crooked Lake. A recent sediment source inventory for the Horsefly River watershed identified 61 sediment sources in this subbasin, of which 57% (35 of 61) are man-made, with only two of the man-made sediment sources not associated with forest development (one being related to agriculture, the other related to recreation).

Sub-basin 3 has a total forested area of 13,111 hectares. In terms of biodiversity, the following table of actual ( and target) seral stage distributions indicates that most of this subunit consists of early seral stages with lesser amounts in mature and old seral stages.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	55 (<22)	42 (>36)	6 (>19)
1	ICH	63 (<30)	33 (>34)	11 (>13)
5	AT	0	0	0

Of the two natural disturbance types (NDT1 and 5) in this subunit, NDT5 (Alpine Tundra) represents only 3.6% of the total forested area. Within NDT1, early seral stages are overrepresented in this unit at present, due to the previous forest harvesting history. In addition, the mid-seral stages represent only a very small portion (3.4%) of the total forested area within this disturbance type.

Within NDT1 (ESSF) both the early and the old seral stages fail to meet the recommended targets. Only the mature plus old category is presently within FPC guidelines. The old seral stage minimum requirement of >19% can be reached, over time, by allowing required portions of the mature component to age further.

Within NDT1 (ICH) none of the seral stage percentages are within the targets, although both the mature and old categories are only 1% and 2% under target, respectively. It will be some time before the early seral stage areas mature into the older categories, due to the paucity of mid-seral stage forest cover. Old growth targets may be met in the future by retaining the existing mature and old forest cover classes.

### 3.4. SUBUNIT #4 - MacKay River

Subunit 4 represents the drainage of the MacKay River, which has an area of 144 square kilometers. This subbasin has generally very steep terrain.

Most of the forest development activity in this subbasin has occurred along the lower elevations of MacKay Creek. Most of this activity is relatively recent so that climax and mature forest types still predominate this subbasin. The recent sediment source inventory for the Horsefly River watershed identified 89 sediment sources in this subbasin, of which 39% (35 of 89) are man-made, with all but one of the man-made sediment sources associated with forest development (the other being related to a minesite).

Sub-basin 4 has a total forested area of 7,562 hectares, with only a small portion in mid-seral stages. In terms of biodiversity, the following table of actual and target seral stage distributions indicates that most of this subunit consists of early and mature seral stages with a smaller amount of old seral stage forest.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	31 (<22)	67 (>36)	9 (>19)
1	ICH	100 (<30)	0 (>34)	0 (>13)
5	AT	0	0	0

Of the two natural disturbance types (NDT1 and 5) in this subunit, NDT5 (Alpine Tundra) represents less than 9% of the total forested area. Within NDT1, early seral stages, at first glance, appear to be highly overrepresented in this unit. Furthermore, the mid-seral stages represent only a very small portion (2.6%) of the total forested area within this disturbance type, an indication of the relatively recent introduction of forest harvesting to the subbasin.

Within NDT1 (ESSF) both the early and the old seral stages fall short of the recommended targets. Only the mature plus old category is presently within FPC guidelines. The old seral stage minimum requirement of >19% can be reached, over time, by allowing appropriate portions of the mature component to age.

Within NDT1 (ICH) none of the seral stage percentages are within the targets, although it is important to recognize that this biogeoclimatic zone covers only one hectare of the subbasin. The overall contribution this biogeoclimatic zone to the subbasin is thus relatively insignificant.

### 3.5. SUBUNIT #5 - Upper McKusky Creek

This subunit is a small (29 km<sup>2</sup>) sub-basin of upper McKusky Creek, above Crooked Lake. There are no roads into this area and no forest development has occurred to date. Only two natural sediment sources were found during the sediment source inventory.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	27 (<22)	65 (>36)	29 (>19)
1	ICH	1 (<30)	99 (>34)	87 (>13)
5	AT	0	0	0

As an unlogged watershed this subunit contains little in the way of mid-seral stage forest cover. Present seral stage distributions meet all of the recommended guidelines for FPC, except for the early seral stage of NDT1 (ESSF) which is only slightly higher than the target figure.

### 3.6. SUBUNIT #6 - Upper McKusky Creek

Subunit 6 represents the mainstem of McKusky Creek, above Crooked Lake. It has an area of 73.8 square kilometers. There are no roads into this area and no forest development has occurred to date. Only three natural sediment sources (gully/slope failures) were found during the recent sediment source inventory.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	6 (<22)	89 (>36)	15 (>19)
1	ICH	6 (<30)	89 (>34)	64 (>13)
5	AT	0	0	0

Except for old growth in NDT1 (ESSF) present seral stage distributions in this subbasin meet all of the recommended guidelines for FPC. The early and mid-seral stages represent only 10% of the total forested area in NDT1. Similarly, NDT2 (Alpine Tundra) accounts for only 5% of the total forested area in this subbasin. There is sufficient mature plus old in this biogeoclimatic zone to enable this target to be met in the future.

### 3.7. SUBUNIT #7 - Upper McKusky Creek

This subunit is a small (20 km<sup>2</sup>) drainage of an unnamed creek which enters McKusky Creek from the south, a short distance above Crooked Lake. No forest development has occurred in this subbasin to date, and there are no roads entering this area. Only one natural sediment source, a gully/slope failure, was found during the sediment source inventory.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	0 (<22)	100 (>36)	31 (>19)
1	ICH	0 (<30)	100 (>34)	67 (>13)
5	AT	0	0	0

Present seral stage distributions in this subbasin meet all of the recommended guidelines for FPC. Within NDT1, the early and mid-seral stages are completely absent from this subunit, and all of the forested area is covered by the two oldest age classes, mature and old. NDT2 (Alpine Tundra) accounts for 15% of the total forested area in this subbasin.

### 3.8. SUBUNIT #8 - Upper McKinley Creek

A small drainage on the northeast side of Gotchen Lake covering some 25.5 km<sup>2</sup>. Some forest development activity has occurred in this subbasin in recent years.

A recent sediment source inventory for the Horsefly River watershed identified 6 sediment sources in this subbasin, of which 33% (2 of 6) are man-made, with one associated with forest development and the other related to recreation.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	0 (<22)	79 (>36)	3 (>19)
2	ICH	14 (<36)	70 (>31)	24 (>9)
5	AT	0	0	0

Present seral stage distributions meet all of the recommended guidelines for FPC, except for the old seral stage of NDT1 (ESSF) which is considerably lower than the target. There is sufficient mature plus old in this biogeoclimatic zone to enable this target to be met in the future.

### 3.9. SUBUNIT #9 - Upper McKinley Creek

Sub-unit 9 includes the upper reaches of the McKinley Creek watershed, upstream of Gotchen Lake. The surface area is 39.7 km<sup>2</sup>.

A recent sediment source inventory for the Horsefly River watershed identified 5 sediment sources in this subbasin, all of which are natural sediment sources.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	20 (<22)	45 (>36)	3 (>19)
2	ICH	0 (<36)	53 (>31)	24 (>9)

Approximately two-thirds of the total forested area (2251 of 3429 ha ) in this subunit is in NDT1, with the balance in NDT2. Present seral stage distributions meet all of the recommended guidelines for the Forest Practices Code, except for the old seral stage of NDT1 (ESSF) which is considerably lower than the target. There is sufficient mature plus old in this biogeoclimatic zone to enable this target to be met in the future through natural recruitment from mature stands.

### 3.10. SUBUNIT #10 - Upper McKinley Creek

This sub-unit covers that portion of the McKinley Creek watershed, between Gotchen Lake and Bosk Lake. The surface area is 41.6 km<sup>2</sup>.

A recent sediment source inventory for the Horsefly River watershed identified 15 sediment sources in this subbasin, of which 73% (11 of 15) are associated with forest development. The rest are natural sediment sources.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	1 (<22)	82 (>36)	4 (>19)
2	ICH	22 (<36)	68 (>31)	12 (>9)
5	AT	0	0	0

Of the total forested area in this subunit, one-half is in NDT1 and one-half in NDT2. NDT5 (Alpine Tundra) represents less than 1% of the total forested area in this subunit. Present seral stage distributions meet all of the recommended guidelines for the Forest Practices Code, except for the old seral stage of NDT1 (ESSF) which is considerably lower than the target. There is sufficient mature plus old in this biogeoclimatic zone to enable this target to be met in the future through natural ageing of existing mature stands.

### 3.11. SUBUNIT #11 - Middle McKinley Creek

Subunit 11 includes the middle portion of the McKinley Creek watershed, between Elbow Lake and Bosk Lake. This subunit covers an area of 180 km<sup>2</sup>.

Forest development is widespread throughout this subbasin. A recently completed sediment source inventory for the Horsefly River watershed identified 83 sediment sources in this subbasin, 94% (78 of 83) of which are manmade, with all but five (ie. 73 of 78 manmade sediment sources) associated with forest development. The five non-forestry related sediment sources are associated with recreation (4) and mining (1).

Subbasin 11 has a total forested area of 16,242 hectares. In terms of biodiversity, the following table of actual ( and target) seral stage distributions indicates that most of this subunit consists of early and mature seral stages with only a lesser proportion in mid-seral and old seral stages.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	35 (<22)	57 (>36)	11 (>19)
1	ICH	36 (<30)	35 (>34)	9 (>13)
2	ICH	31 (<36)	48 (>31)	4 (>9)
5	AT	0	0	0

Of the three natural disturbance types (NDT1,2 and 5) in this subunit, NDT5 (Alpine Tundra) represents less than 1% of the total forested area. Early seral stages of NDT1 are overrepresented in this unit at present.

Within NDT1 (ESSF) both the early and the old seral stages fall short of the recommended targets. Only the mature plus old category is presently within FPC guidelines. The old seral stage minimum requirement of >19% can be reached over time, by allowing portions of the mature component to age further.

Within NDT1 (ICH) only the mature plus old category is presently within FPC guidelines, with 35% actual compared to 34% recommended. Both the early and the old seral stages do not meet the recommended targets. Mid-seral stages in this category occupy 1109 ha, or one-third, of the total forested area. However, it will be some time before the early and mid-seral stage areas mature into the older categories.

Within NDT2 (ICH) the seral stage percentages meet the target percentages with the exception of old growth forests. Old growth targets can only be met in the future by retaining sufficient mature forests.

### 3.12. SUBUNIT #12 - Molybdenite (McKinley) Creek

This subunit covers that portion of the McKinley Creek watershed drained by Molybdenite Creek. The surface area is 80 km<sup>2</sup>.

A recently completed sediment source inventory for the Horsefly River watershed identified 43 sediment sources in this subbasin, 98% (42 of 43) of which are man-made, with all but two of these (i.e. 40 of 42 sediment sources) associated with forest development. The three non-forestry related sediment sources are associated with mining (1) and natural slope/gully failures (2).

Subbasin 12 has a total forested area of 7,173 hectares. The following table shows actual and target seral stage distributions within this subunit.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	9 (<22)	78 (>36)	46 (>19)
2	ICH	34 (<36)	52 (>31)	1 (>9)
3	SBS	30 (<54)	20 (>23)	0 (>11)
5	AT	0	0	0

Of the four natural disturbance types (NDT1,2,3 and 5) in this subunit, NDT5 (Alpine Tundra) represents less than .03% of the total forested area. Within NDT1 (ESSF) all of the seral stages are presently within Forest Practices Code guidelines.

Within NDT2 (ICH) the seral stage percentages meet the target percentages with the exception of old forests. Old growth targets for NDT2 can be met in the future by retaining a sufficient amount of the mature forest component.

Natural disturbance type 3 represents only slightly more than 1% of the total forested area in this subunit. Within NDT3 (SBS) only the early seral stage category is presently within FPC guidelines. Both the mature plus old and the old seral stages fall short of the recommended targets. There is no old growth SBS left in this subbasin. Mid-seral stages occupy 40 ha, or one-half, of the total forested area in this category. As the mid-seral and mature stages age they have the potential to meet the recommended percentages for the two oldest categories.

### 3.13. SUBUNIT #13 - Lower McKinley Creek

Subunit 13 covers the lower portion of the McKinley Creek watershed between the Horsefly River and Elbow Lake. It has a surface area of 77 km<sup>2</sup>.

Forest development is widespread throughout this subbasin. A recently completed sediment source inventory for the Horsefly River watershed identified 37 sediment sources in this subbasin, 84% (31 of 37) of which are man-made, with all but three (ie. 28 of 31 manmade sediment sources) associated with forest development. Of the three manmade, but non-forestry related, sediment sources two are associated with recreation and one with agriculture.

Subbasin 13 has a total forested area of 6724 hectares, with 11% (722 ha.) within known mule deer winter ranges. In terms of biodiversity, the following table of actual and target seral stage distributions indicates that most of this subunit, not including the mule deer winter range area, consists of early (18.1%) and mid-seral (58.7%) stages with only lesser amounts in mature and old seral stages (16.1% and 7%, respectively).

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	25 (<22)	24 (>36)	13 (>19)
1	ICH	32 (<30)	30 (>34)	5 (>13)
2	ICH	18 (<36)	31 (>31)	8 (>9)
3	SBS	2 (<54)	3 (>23)	2 (>11)

Within NDT1 (ESSF) all three seral stages do not meet the recommended targets. The mid-seral stage represents the largest category of forest cover type in NDT1 (ESSF) at present.

Within NDT1 (ICH) none of the seral stage percentages are within the targets and it will be some time before the two early seral stages (early and mid-seral) can mature into the older categories. Old growth targets can be met in the future by allowing an appropriate amount of mature cover to reach climax conditions.

Within NDT2 the seral stage percentages are close to the target percentages for the mature plus old and old categories. Careful planning of forest harvesting activities should allow these figures to be maintained in the future.

Actual seral stage distributions in natural disturbance type 3 (SBS) diverge considerably from recommended targets. Nearly 96% of the total forested area in NDT3 consists of the mid-seral stage. It will be some time before the mid-seral stage areas mature into the older categories. Old and mature plus old targets can only be met in the future through careful planning and retention of existing mature and old forests.

The 722 ha of mule deer winter range in this subbasin are found within three natural disturbance types (NDT1,2&3), and the seral stage distributions of these are as follows:

MULE DEER WINTER RANGE

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	0 (<22)	0 (>36)	2 (>19)
2	ICH	5 (<36)	6 (>31)	5 (>9)
3	SBS	0 (<54)	4 (>23)	0 (>11)

Most of the mule deer winter range in this subunit (619 ha or 86%) occurs within NDT2 (ICH). NDT1 (ESSF) and NDT3 (SBS) represent only 6.6% and 7.6%, respectively, of the total mule deer winter range area. Within all three natural disturbance types, the mature plus old and old seral stages fall short of the recommended minimum requirements. Because the mid-seral stage covers 90% (649 ha) of the mule deer winter range area, these mature and old seral stage objectives may be reached over time by allowing portions of the mid-seral stage component to age.

### 3.14. SUBUNIT #14 - Horsefly River (Doreen Creek)

This small subunit (20 km<sup>2</sup>) consists of the watershed of Doreen Creek which enters the Horsefly River from the south, approximately half way between McKusky and McKinley Creeks. Of the 13 sediment sources recently identified in the subbasin, 11 are associated with forest harvesting activities, while two are natural sediment sources. This entire subunit lies within known mule deer winter ranges.

Subbasin 14 has a total forested area of 2011 hectares, roughly equally distributed between the early, mid-seral, and mature plus old categories (ie. 38%, 28% & 34%, respectively).

#### MULE DEER WINTER RANGE

##### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	45 (<22)	24 (>36)	3 (>19)
1	ICH	18 (<30)	47 (>34)	11 (>13)
2	ICH	50 (<36)	43 (>31)	16 (>9)

Most of this subunit (1160 ha or 57.7%) occurs within NDT1 (ESSF); NDT1 (ICH) and NDT2 (ICH) represent only 27% and 15%, respectively, of the total area.

Within NDT1 (ESSF) all three seral stage categories fall short of the recommended levels. The mature and old seral stage objectives may be reached over time by allowing portions of the early and mid-seral stage components to age.

Within NDT1 (ICH) the old seral stage category falls short of the recommended target. The old seral stage objective may be reached over time by allowing portions of the mature seral stage component to reach climax conditions

The early seral stage composition in natural disturbance type 2 (ICH) is considerably greater than the recommended target, likely due to recent forest harvesting activities. Both the old and mature plus old seral stages currently fall within Forest Practices Code guidelines and careful planning will allow retention of appropriate amounts of these mature and old forest types.

### 3.15. SUBUNIT #15 - Middle Horsefly River above Little Horsefly River.

This subunit is a face unit of the lower mainstem of the Horsefly River and consists of a number of small drainages which flow directly into the Horsefly River between McKinley Creek and the Little Horsefly River. It is one of the larger subunits with a surface area of 237.5 square kilometers.

Forest development is widespread throughout much of this subbasin. A recently completed sediment source inventory for the Horsefly River watershed identified 79 sediment sources in this subbasin, 77% of which are man-made, with 53% associated with forest development. Of the nineteen manmade, but non-forestry related, sediment sources, sixteen are associated with agriculture, two are associated with mining and one with recreation.

Subbasin 15 has a total forested area of 21,207 hectares, with 11.5% (2448 ha.) in known mule deer winter ranges. Most of this subunit, including the mule deer winter range area, consists of mature and mid-seral stages with only a lesser proportion in early and old seral stages.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	11 (<22)	32 (>36)	3 (>19)
2	ICH	0 (<36)	3 (>31)	0 (>9)
3	SBPS	17 (<66)	36 (>17)	13 (>7)
3	SBS	9 (<54)	21 (>23)	2 (>11)

Of the three natural disturbance types (NDT1,2 and 3) in this subunit, NDT3 (SBS & SBPS) represents more than 82% of the total forested area. Mid-seral stages represent nearly two-thirds of the forested area in this unit at present, due largely to the previous forest harvesting history.

Within NDT1 (ESSF) both the mature plus old and the old seral stages fall short of the recommended targets. Only the early category is presently within FPC guidelines. The old seral stage minimum requirement of >19% can be reached over time, by allowing portions of the mature and mid-seral stage components to age further.

Within NDT2 (ICH) only the early category is presently within its seral stage target. This natural disturbance type represents only 0.3% (69 ha) of the total forested area outside the mule deer winter range.

Within NDT3 (SBS & SBPS) the seral stage percentages are generally well within the target percentages. The two exceptions are the mature plus old and old seral stages in the SBS biogeoclimatic zone. The mid-seral stage (between early and mature) represents a large portion (nearly 70%) of the total forested area in NDT3 (SBS) at present. Old and mature plus old targets may be met in the future as this mid-seral component ages.

The 2448 ha of mule deer winter range found in this subbasin are found within three natural disturbance types (NDT1,2&3), and the seral stage distributions of these are as follows:

MULE DEER WINTER RANGE

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	0 (<22)	0 (>36)	0 (>19)
2	ICH	0 (<36)	5 (>31)	0 (>9)
3	SBS	2 (<54)	19 (>23)	4 (>11)

Most of the mule deer winter range in this subunit (2249 ha or 92%) occurs within NDT3, and NDT2 (ICH) and NDT1 (ESSF) represent only 7.5% and 0.5%, respectively, of the total mule deer winter range area. Within all three natural disturbance types, the mature plus old and old seral stages fall short of the recommended minimum requirements. Because the mid-seral stage covers 80.5% (1971 ha) of the mule deer winter range area, these mature and old seral stage objectives may be reached over time by allowing portions of the mid-seral stage component to age.

### 3.16. SUBUNIT #16 - Tisdall Creek

Tisdall Creek drains Tisdall Lake into the Horsefly River just below Black Creek. Subunit 16 encompasses some 71 square kilometers of land near the geographic centre of the Horsefly River drainage. Of the 29 sediment sources recently identified in the subbasin, approximately 86% are associated with forest harvesting activities. Of the four other non-forestry sediment sources, one is related to recreational interests and the remaining three are natural sediment sources. This subunit has no known mule deer winter ranges within its boundaries.

Subbasin 16 has a total forested area of 6378 hectares, with slightly more than one-half in the mid-seral category (54% or 3441 ha).

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	34 (<22)	50 (>36)	0 (>19)
2	ICH	35 (<36)	15 (>31)	0 (>9)
3	SBS	7 (<54)	21 (>23)	8 (>11)

Of the three natural disturbance types (NDT's 1,2 and 3) in this subunit, NDT3 (SBS) represents more than 57% of the total forested area.

Within NDT1 (ESSF) both the early and the old seral stages do not meet the recommended targets. Only the mature plus old category is presently within FPC guidelines. The old seral stage minimum requirement of >19% can be reached over time, by allowing portions of the mature and mid-seral stage components to age further.

Within NDT2 (ICH) only the early category is presently within its seral stage target. Over 50% of the total forested area in this natural disturbance type is in the mid-seral stage category. Old and mature plus old targets may be met in the future as this mid-seral component matures

Within NDT3 (SBS) the seral stage percentages are generally close to or within the target percentages. The mid-seral stage (between early and mature) represents a large portion (nearly 72%) of the total forested area in NDT3 (SBS) at present. In the future, old and mature targets may be met as this mid-seral component ages.

### 3.17. SUBUNIT #17 - Moffat Creek

A small subunit covering the north-central portion of the Moffat Creek watershed and covering 74 km<sup>2</sup>. All of the 12 sediment sources recently identified in the subbasin are associated with forest harvesting activities. This subunit has no known mule deer winter range areas within its boundaries.

Subbasin 17 has a total forested area of 8319 hectares, with nearly one-half (49.5%) in the mature seral category.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	13 (<22)	47 (>36)	4 (>19)
3	SBS	13 (<54)	85 (>23)	24 (>11)

There are two natural disturbance types within this subunit. With the exception of the old seral stage in the NDT1 (ESSF) all of the seral stage components are within Forest Practices Code biodiversity guidelines. The old seral stage requirement for NDT1 (ESSF) can eventually be met through recruitment from the mature seral stage forest type in the subunit.

### 3.18. SUBUNIT #18 - Woodjam Creek

Subunit 18 includes the lower portion of Woodjam Creek which flows directly into the Horsefly River from the south. The surface area is 64 square kilometers. Of the 12 sediment sources recently identified in the subbasin, two-thirds (8) are associated with forest harvesting activities. Of the four other sediment sources, one is a natural sediment source and the remaining three are related to agriculture. This subunit has no known mule deer winter range area within its boundaries.

Subbasin 18 has a total forested area of 6036 hectares, with more than one-half (57.8% or 3494 ha) in the mid-seral category.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	0 (<22)	35 (>36)	15 (>19)
3	SBPS	0 (<66)	59 (>17)	10 (>7)
3	SBS	7 (<54)	24 (>23)	7 (>11)

Within NDT1 (ESSF) both the mature plus old and old seral stages are slightly lower than, but within 1% to 4% of, the recommended targets. The mature and old seral stage requirements for NDT1 (ESSF) can eventually be met through recruitment from the mid-seral stage forest type in the subunit.

There are two biogeoclimatic subzones within natural disturbance type 3 in this subunit. In NDT3 (SBPS) all of the seral stage components are within Forest Practices Code biodiversity guidelines. In NDT3 (SBS) the old seral stage component is less than that recommended in the Forest Practices Code biodiversity guidelines. There is a large component (68%) of mid-seral stage forest type in the NDT3 (SBS) which will allow the old growth target to be met in the future.

### 3.19. SUBUNIT #19 - Woodjam Creek

A small subbasin of Woodjam Creek, subunit 19 covers 12.7 km<sup>2</sup>. There were no sediment sources identified in this subunit. Subbasin 19 has a total forested area of 1253 hectares, with nearly 85% ( 1056 ha) in the mid-seral category.

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	9 (<22)	19 (>36)	0 (>19)
3	SBPS	0 (<66)	2 (>17)	1 (>7)
3	SBS	3 (<54)	8 (>23)	0 (>11)

Within all three natural disturbance types in this subunit, the mature plus old and old seral stages fall short of the recommended Forest Practices Code minimum requirements. Because the mid-seral stage covers nearly 85% of the forested area in subunit 19, the mature and old seral stage objectives may be reached over time by allowing adequate portions of the mid-seral stage component to age.

### 3.20. SUBUNIT #20 - Woodjam Creek

Subunit 20 incorporates the upper portion of Woodjam Creek immediately north of the Moffat Creek watershed. The surface area is 13 square kilometers. Three manmade sediment sources were identified in this unit, all associated with forest harvesting and access roads.

Subbasin 20 has a total forested area of 1249 hectares, with nearly half (45% or 560 ha) in the mid-seral category. This entire subunit is located in mule deer winter range.

#### MULE DEER WINTER RANGE

##### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	100 (<22)	0 (>36)	0 (>19)
3	SBPS	0 (<66)	56 (>17)	24 (>7)
3	SBS	37 (<54)	6 (>23)	2 (>11)

Within NDT1 (ESSF) none of the three seral stages (early, mature plus old, and old) meet the recommended Forest Practices Code requirements. NDT1 covers only 11% (138 ha) of the total forested area in the subunit and all of this natural disturbance type is in an early stage of seral development. It will be a long time before the mature and old seral stages can become reestablished in the NDT1 (ESSF) zone.

Within NDT3 (SBPS) the existing seral stage distribution is within the levels recommended under FPC guidelines.

Within NDT3 (SBS) the early seral stage component is within FPC guidelines, however, the mature plus old and old seral stages fall short of the recommended Forest Practices Code minimums. Because the mid-seral stage covers nearly 57% of the forested area in NDT3 (SBS), the mature and old seral stage objectives may be reached over time by allowing sufficient amounts of the mid-seral stage component to develop into these age classes.

### 3.21. SUBUNIT #21 - Moffat Creek

The largest of all the subunits at 483 sq. km., subunit 21 encompasses most of the Moffat Creek drainage. Moffat Creek enters the Horsefly River just upstream of the community of Horsefly.

Forest development is widespread throughout much of this subbasin. A recently completed sediment source inventory for the Horsefly River watershed identified 127 sediment sources in this subbasin. Approximately 91% of the sediment sources are man-made, with 73% associated with forest development. Of the 22 non-forestry related, manmade sediment sources, all are associated with agriculture. There are only 12 natural sediment sources in this subunit.

Sub-basin 15 has a total forested area of 40,454 hectares, with less than 1% (378 ha) in known mule deer winter ranges. In terms of biodiversity, most of this subunit, including the mule deer winter range area, consists of mature and mid-seral stages (75.7%) with only a lesser percentage (24.3%) in early and old seral stages.

#### SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

NDT	BGCZ	EARLY	MATURE & OLD	OLD
1	ESSF	21 (<22)	44 (>36)	13 (>19)
3	SBPS	14 (<66)	51 (>17)	7 (>7)
3	SBS	16 (<54)	60 (>23)	2 (>11)
5	AT	0	0	0

Of the three natural disturbance types (NDT1,3 and 5) in this subunit, NDT3 represents more than 73% of the total forested area. Mid-seral stages represent one-third of the forested area in this unit at present, due largely to the previous forest harvesting history. NDT5 (Alpine Tundra) represents only a small fraction of 1% of the total forested area in this subunit.

Within NDT1 (ESSF) the old seral stage component falls short of the recommended target. The old seral stage minimum requirement of >19% can be reached, over time, by allowing portions of the mature and mid-seral stage components to age further.

Within NDT3 the seral stage percentages fall well within the target percentages except for the old seral stage components in the SBS and SBPS biogeoclimatic subzones. The mature seral stage represents a significant portion (47.2%) of the total forested area in NDT3 at present. Old growth targets may be met in the future as this large mature component ages.

The 378 ha of mule deer winter range found in this subbasin are located within natural disturbance type 3, and the seral stage distribution of the mule deer winter range area as follows:

MULE DEER WINTER RANGE

SERAL STAGE DISTRIBUTION PERCENTAGES -Actual (Target)

<b>NDT</b>	<b>BGCZ</b>	<b>EARLY</b>	<b>MATURE &amp; OLD</b>	<b>OLD</b>
<b>3</b>	<b>SBPS</b>	22 (<66)	47 (>17)	27 (>7)

Within this natural disturbance type, all three seral stage groupings (early, mature plus old and old) fall within of the recommended levels of the Forest Practices Code.

#### 4.0 SUMMARY

A biodiversity analysis of the 213,800 hectare Horsefly River watershed was conducted under the auspices of the Watershed Restoration Program (WRP) of Forest Renewal British Columbia (FRBC). The analysis was conducted using seral stage information provided by the Ministry of Forests and mule deer winter range information provided by the Ministry of Environment, Lands and Parks. Actual seral stage distributions were compared to target seral stage distributions under Forest Practices Code guidelines. The study area, the Horsefly River watershed upstream of the Little Horsefly River, is comprised of 21 subbasins or subunits. Six of these subbasins contain portions of known mule deer winter ranges. These mule deer winter range areas were analysed separately from the rest of the subunit, except for units #14 and #20 where the entire subunits consist of mule deer winter range.

Within each subunit, three separate seral groupings were assessed for compliance with FPC recommended levels. The three seral stage groups are early seral, mature plus old seral, and old seral. Each of these was analysed according to natural disturbance type (NDT) and biogeoclimatic zone. The following table summarizes the detailed information presented in the previous section (Section 3.0). It shows the percentage of the total number of seral stages in each subunit which do not meet the recommended FPC targets. NDT5 (Alpine Tundra) information was not included in the table.

<b>Sub-Basin</b>	<b>Seral stages outside FPC (%)</b>	<b>Sub-Basin</b>	<b>Seral stages outside FPC (%)</b>
1	33	13	83
2	89	13 MDWR	66
2 MDWR	66	14 MDWR	55
3	83	15	50
4	83	15 MDWR	66
5	17	16	66
6	17	17	17
7	0	18	33
8	17	19	66
9	33	20 MDWR	55
10	17	21	33
11	55	21 MDWR	0
12	33		

The 21 subbasins, and 6 subbasins containing mule deer winter range, fall into three groupings with respect to the percentage of seral stages outside of FPC guidelines. The following table shows the distribution of subunits and is an indication of the relative priorities for forest harvesting planning and potential rehabilitation activities.

<b>GROUP</b>	<b>Seral stage outside FPC (%)</b>	<b>Subunit Numbers</b>
<b>1</b>	<b>0-34</b>	<b>1,5,6,7,8,9,10,12, 17,18,&amp; 21 MDWR21</b>
<b>2</b>	<b>34-67</b>	<b>11, 15,16,&amp;19 MDWR 2,13,14 15&amp;20</b>
<b>3</b>	<b>67-100</b>	<b>2,3,4,&amp;13</b>

In general, those subunits closest to the outer boundaries of the watershed, that is to say the more remote areas, meet the FPC guidelines for seral stage distributions. In contrast, four subunits near the central portion of the watershed are the most out of compliance with FPC targets. These subunits generally are deficient in both old and mature plus old seral stages and also have too much early seral cover.

As part of the biodiversity assessment, the total number of NDT/biogeoclimatic variants which do not meet FPC guidelines was determined for each of the seral stage groupings. Numbers and percentages are presented in the following table.

<b>SERAL STAGE</b>	<b>NDT/BGC # vs total #</b>	<b>Percentage of total</b>
<b>EARLY</b>	<b>16/63</b>	<b>25</b>
<b>MATURE &amp; OLD</b>	<b>28/63</b>	<b>44</b>
<b>OLD</b>	<b>48/63</b>	<b>76</b>

Within the two oldest categories, mature plus old and old growth, a significant proportion of the NDT/biogeoclimatic variants are well under FPC recommended seral stage targets. Old growth forest types exhibit the greatest departure from target levels with more than three-quarters of the NDT/biogeoclimatic variants having less than the recommended percentage of old growth. Forest planning in the Horsefly River watershed must take these target deficits into account with respect to future harvesting activities.

5.1 Appendix 1: Biodiversity Summary Table

SUB-BASIN	NDT	BGCZ	EARLY	TARGET	M&O	TARGET	OLD	TARGET
NUMBER			%	%<	%	>%	%	>%
1	1	ESSF	7	22	91	36	7	19
1	5	AT	0		0		0	
2	1	ESSF	55	22	48	36	5	19
2	1	ICH	77	30	20	34	1	13
2	2	ICH	87	36	3	31	1	9
2	5	AT	0		0		0	
MDWR-2	1	ESSF	3	22	17	36	10	19
MDWR-2	2	ICH	7	36	6	31	0	9
3	1	ESSF	55	22	42	36	6	19
3	1	ICH	63	30	33	34	11	13
3	5	AT	0		0		0	
4	1	ESSF	31	22	67	36	9	19
4	1	ICH	100	30	0	34	0	13
4	5	AT	0		0		0	
5	1	ESSF	27	22	65	36	29	19
5	1	ICH	1	30	99	34	87	13
5	5	AT	0		0		0	
6	1	ESSF	6	22	89	36	15	19
6	1	ICH	6	30	89	34	64	13
6	5	AT	0		0		0	
7	1	ESSF	0	22	100	36	31	19
7	1	ICH	0	30	100	34	67	13
7	5	AT	0		0		0	
8	1	ESSF	0	22	79	36	3	19
8	2	ICH	14	36	70	31	24	9
8	5	AT	0		0		0	
9	1	ESSF	20	22	45	36	3	19
9	2	ICH	0	36	53	31	24	9
10	1	ESSF	1	22	82	36	4	19
10	2	ICH	22	36	68	31	12	9
10	5	AT	0		0		0	
11	1	ESSF	35	22	57	36	11	19
11	1	ICH	36	30	35	34	9	13
11	2	ICH	31	36	48	31	4	9
11	5	AT	0		0		0	
12	1	ESSF	9	22	78	36	46	19
12	2	ICH	34	36	52	31	1	9
12	3	SBS	30	54	20	23	0	11
12	5	AT	0		0		0	
13	1	ESSF	25	22	24	36	13	19
13	1	ICH	32	30	30	34	5	13
13	2	ICH	18	36	31	31	8	9

5.1 Appendix 1: Biodiversity Summary Table

13	3	SBS	2	54	3	23	2	11
MDWR - 13	1	ESSF	0	22	0	36	2	19
MDWR - 13	2	ICH	5	36	6	31	5	9
MDWR - 13	3	SBS	0	54	4	23	0	11
MDWR - 14	1	ESSF	45	22	24	36	3	19
MDWR - 14	1	ICH	18	30	47	34	11	13
MDWR - 14	2	ICH	50	36	43	31	16	9
15	1	ESSF	11	22	32	36	3	19
15	2	ICH	0	36	3	31	0	9
15	3	SBPS	17	66	36	17	13	7
15	3	SBS	9	54	21	23	2	11
MDWR - 15	1	ESSF	0	22	0	36	0	19
MDWR - 15	2	ICH	0	36	5	31	0	9
MDWR - 15	3	SBS	2	54	19	23	4	11
16	1	ESSF	34	22	50	36	0	19
16	2	ICH	35	36	15	31	0	9
16	3	SBS	7	54	21	23	8	11
17	1	ESSF	13	22	47	36	4	19
17	3	SBS	13	54	85	23	24	11
18	1	ESSF	0	22	35	36	15	19
18	3	SBPS	0	66	59	17	10	7
18	3	SBS	7	54	24	23	7	11
19	1	ESSF	9	22	19	36	0	19
19	3	SBPS	0	66	2	17	1	7
19	3	SBS	3	54	8	23	0	11
MDWR - 20	1	ESSF	100	22	0	36	0	19
MDWR - 20	3	SBPS	0	66	56	17	24	7
MDWR - 20	3	SBS	37	54	6	23	2	11
21	1	ESSF	21	22	44	36	13	19
21	3	SBPS	14	66	51	17	7	7
21	3	SBS	16	54	60	23	2	11
21	5	AT	0		0		0	
MDWR-21	3	SBPS	22	66	47	17	27	7

## 5.2 Appendix 2: Complete Biodiversity Database by Subunit

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)				
		Early	"Grey" (Mature + Old)			Early	"Grey"	Mature	Old	
WATERSHED: 1 - Horsefly just upstream from MacKay River										
NDT1										
ESSFwc3	2042	0	14	2019	9	0 (< 22)	1	99 (> 36)	0 (> 19)	
ESSFwk1	3685	414	64	2815	392	11 (< 22)	2	76 (> 36)	11 (> 19)	
	=====	=====	=====	=====	=====					
	5727	414	77	4834	401					
NDT5										
AT	318	0	318	0	0	0 ( )	100	0 ( )	0 ( )	
	=====	=====	=====	=====	=====					
	318	0	318	0	0					
	=====	=====	=====	=====	=====					
Watershed Totals	6045	414	395	4834	401					

## WATERSHED: 2 -

NDT1										
ESSFwc3	3004	1112	120	1620	152	37 (< 22)	4	54 (> 36)	5 (> 19)	
ESSFwk1	7206	3995	533	2367	311	55 (< 22)	7	33 (> 36)	4 (> 19)	
ICHwk2	4663	3586	135	885	58	77 (< 30)	3	19 (> 34)	1 (> 13)	
	=====	=====	=====	=====	=====					
	14874	8693	788	4872	521					

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT2									
ICHmk3	657	571	68	13	5	87 (< 36)	10	2 (> 31)	1 (> 9)
	=====	=====	=====	=====	=====				
	657	571	68	13	5				
NDT5									
AT	54	0	54	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	54	0	54	0	0				
	=====	=====	=====	=====	=====				
Sub-Total	15584	9264	909	4886	526				
Mule Deer Winter Range: HORSEFLY_RIVER									
NDT1									
ESSFwk1	60	2	49	4	6	3 (< 22)	81	7 (> 36)	10 (> 19)
	=====	=====	=====	=====	=====				
	60	2	49	4	6				
NDT2									
ICHmk3	211	15	184	12	0	7 (< 36)	87	6 (> 31)	0 (> 9)
	=====	=====	=====	=====	=====				
	211	15	184	12	0				
	=====	=====	=====	=====	=====				
Winter Rge Total	271	17	233	16	6				
	=====	=====	=====	=====	=====				
Watershed Totals	15856	9281	1142	4902	532				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
WATERSHED: 3 -									
NDT1									
ESSFwc3	2274	1266	0	980	28	56 (< 22)	0	43 (> 36)	1 (> 19)
ESSFwk1	3542 <sup>5816</sup>	1919	168	1164	292	54 (< 22)	5	33 (> 36)	8 (> 19)
ICHwk2	6820	4322	262	1515	721	63 (< 30)	4	22 (> 34)	11 (> 13)
	=====	=====	=====	=====	=====				
	12636	7506	430	3659	1041				
NDT5									
AT	475	0	475	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	475	0	475	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	13111	7506	905	3659	1041				

## WATERSHED: 4 - MacKay River at its mouth

NDT1									
ESSFwc3	2728	241	82	2355	50	9 (< 22)	3	86 (> 36)	2 (> 19)
ESSFwk1	4164 <sup>6843</sup>	1864	99	1610	591	45 (< 22)	2	39 (> 36)	14 (> 19)
ICHwk2	1	1	0	0	0	100 (< 30)	0	0 (> 36)	0 (> 13)
	=====	=====	=====	=====	=====				
	6893	2106	181	3965	641				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT5									
AT	669	0	669	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	669	0	669	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	7562	2106	850	3965	641				

WATERSHED: 5 - Right bank tributary upstream from Crooked Lake

NDT1									
ESSFwc3	1038	340	65	383	250	33 (< 22)	6	37 (> 36)	24 (> 19)
ESSFwk1	490	80	47	171	193	16 (< 22)	10	35 (> 36)	39 (> 19)
ICHwk2	316	2	2	32	280	1 (< 30)	1	10 (> 34)	89 (> 13)
	=====	=====	=====	=====	=====				
	1843	422	113	586	723				
NDT5									
AT	122	0	122	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	122	0	122	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	1966	422	236	586	723				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
WATERSHED: 6 -									
NDT1									
ESSFwc3	2335	101	144	2064	27	4 (< 22)	6	88 (> 36)	1 (> 19)
ESSFwk1	1458 / 3793	111	56	738	553	8 (< 22)	4	51 (> 36)	38 (> 19)
ICHwk2	1091	72	46	269	703	7 (< 30)	4	25 (> 34)	64 (> 13)
	=====	=====	=====	=====	=====				
	4883	283	246	3071	1284				
NDT5									
AT	344	0	344	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	344	0	344	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	5227	283	590	3071	1284				

WATERSHED: 7 - Left bank tributary upstream from Crooked Lake

NDT1									
ESSFwc3	309	0	0	248	61	0 (< 22)	0	80 (> 36)	20 (> 19)
ESSFwk1	280 / 589	0	0	159	121	0 (< 22)	0	57 (> 36)	43 (> 19)

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NOT1 ICHwk2	224	0	0	73	151	0 (< 30)	0	33 (> 34)	67 (< 3)
	813	0	0	480	333				(> 13)
NDT5 AT	143	0	143	0	0	0 ( )	100	0 ( )	0 ( )
	143	0	143	0	0				
Watershed Totals	957	0	143	480	333				

WATERSHED: 8 - Stream entering north end of Gotchen Lake

NDT1 ESSFwc3	665	0	42	623	0	0 (< 22)	6	94 (> 36)	0 (> 19)
	676	0	242	400	34	0 (< 22)	36	59 (> 36)	5 (> 19)
	1341	0	284	1022	34				
NDT2 ICHmk3	565	77	92	260	136	14 (< 36)	16	46 (> 31)	24 (> 9)
	565	77	92	260	136				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT5									
AT	37	0	37	0	0	0 ( )	100	0 ( )	0 ( )
	===== 37	===== 0	===== 37	===== 0	===== 0				
Watershed Totals	1943	77	413	1282	170				

WATERSHED: 9 - McKinley Creek where it enters Gotchen Lake

NDT1									
ESSFwc3	481	192	48	241	0	40 (< 22)	10	50 (> 36)	0 (> 19)
ESSFwk1	1770	256	745	692	77	14 (< 22)	42	39 (> 36)	4 (> 19)
	===== 2251	===== 448	===== 793	===== 933	===== 77				
NDT2									
ICHmk3	1178	0	552	347	279	0 (< 36)	47	29 (> 31)	24 (. 9)
	===== 1178	===== 0	===== 552	===== 347	===== 279				( > 9 )
Watershed Totals	3429	448	1345	1280	356				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
WATERSHED: 10 -									
NDT1									
ESSFwc3	434	0	0	434	0	0 (< 22)	0	100 (> 36)	0 (> 19)
ESSFwk1	1335	19	306	939	72	1 (< 22)	23	70 (> 36)	5 (> 19)
	=====	=====	=====	=====	=====				
	1769	19	306	1373	72				
NDT2									
ICHmk3	1981	445	197	1094	245	22 (< 36)	10	55 (> 31)	12 (> 9)
	=====	=====	=====	=====	=====				
	1981	445	197	1094	245				
NDT5									
AT	10	0	10	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	10	0	10	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	3760	463	513	2467	317				

## WATERSHED: 11 -

NDT1									
ESSFwc3	1399	200	8	971	220	14 (< 22)	1	69 (> 36)	16 (> 19)

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
ESSFwk1	2614 / 4013	1215	299	656	444	46 (< 22)	11	25 (> 36)	17 (> 9)
ICHwk2	3828	1391	1109	985	344	36 (< 30)	29	26 (> 34)	9 (> 13)
	=====	=====	=====	=====	=====				( > 13 )
	7842	2806	1416	2612	1008				
NDT2									
ICHmk3	8379	2579	1766	3736	297	31 (< 36)	21	45 (> 31)	4 (> 9)
	=====	=====	=====	=====	=====				
	8379	2579	1766	3736	297				
NDT5									
AT	22	0	22	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	22	0	22	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	16242	5386	3203	6348	1305				

WATERSHED: 12 - Molybdenite Creek where it enters McKinley Creek

NDT1									
ESSFwc3	1675	24	24	544	1083	1 (< 22)	1	32 (> 36)	65 (> 19)
ESSFwk1	2744	391	538	873	942	14 (< 22)	20	32 (> 36)	34 (> 19)
	=====	=====	=====	=====	=====				
	4419	415	562	1417	2024				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT2									
ICHmk3	2671	901	394	1354	23	34 (< 36)	15	51 (> 31)	1 (> 9)
	=====	=====	=====	=====	=====				
	2671	901	394	1354	23				
NDT3									
SBSdw1	82	25	40	16	0	31 (< 54)	49	20 (> 23)	0 (> 11)
	=====	=====	=====	=====	=====				
	82	25	40	16	0				
NDT5									
AT	2	0	2	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	2	0	2	0	0				
	=====	=====	=====	=====	=====				
Watershed Totals	7173	1340	999	2787	2047				

WATERSHED: 13 - McKinley Creek downstream from where it flows into McKinley Lake

NDT1									
ESSFwk1	1119	280	571	124	144	25 (< 22)	51	11 (> 36)	13 (> 19)
ICHwk2	1096	352	415	275	54	32 (< 30)	38	25 (> 34)	5 (> 13)
	=====	=====	=====	=====	=====				
	2216	632	985	399	198				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT2									
ICHmk3	2420	433	1234	556	198	18 (< 36)	51	23 (> 31)	8 (> 9)
	=====	=====	=====	=====	=====				
	2420	433	1234	556	198				
NDT3									
SBSdw1	1366	21	1307	14	25	2 (< 54)	96	1 (> 23)	2 (> 11)
	=====	=====	=====	=====	=====				
	1366	21	1307	14	25				
	=====	=====	=====	=====	=====				
Sub-Total	6002	1086	3526	969	421				
Mule Deer Winter Range: HORSEFLY_RIVER									
NDT1									
ESSFwk1	48	0	47	0	1	1 (< 22)	97	0 (> 36)	2 (> 19)
	=====	=====	=====	=====	=====				
	48	0	47	0	1				
NDT2									
ICHmk3	619	33	549	7	30	5 (< 36)	89	1 (> 31)	5 (> 9)
	=====	=====	=====	=====	=====				
	619	33	549	7	30				
NDT3									
SBSdw1	55	0	53	2	0	0 (< 54)	96	4 (> 23)	0 (> 11)
	=====	=====	=====	=====	=====				
	55	0	53	2	0				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
Winter Rge Total	722	34	649	9	31				
Watershed Totals	6724	1119	4175	978	452				

WATERSHED: 14 - Doreen Creek at its mouth

Mule Deer Winter Range:

NDT1										
ESSFwk1	1160	521	354	247	37	45 (< 22)	31	21 (> 36)	3 (> 19)	
ICHwk2	545	99	187	196	62	18 (< 30)	34	36 (> 34)	11 (> 13)	
	1704	620	542	443	100					
NDT2										
ICHmk3	307	152	25	82	49	49 (< 36)	8	27 (> 31)	16 (> 9)	
	307	152	25	82	49					
Watershed Totals	2011	772	567	525	148					

WATERSHED: 15 - Face units between the mouths of McKinley and Moffat

NDT1										
ESSFwc3	985	310	267	408	0	31 (< 22)	27	41 (> 36)	0 (> 19)	

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)				
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old	
ESSFwk1	2294	64	1591	532	107	3 (< 22)	69	23 (> 36)	5 (> 19)	
	===== 3279	===== 374	===== 1858	===== 940	===== 107				(> 19)	
NDT2 ICHmk3	69	0	68	2	0	0 (< 36)	97	3 (> 31)	0 (> 9)	
	===== 69	===== 0	===== 68	===== 2	===== 0					
NDT3	SBPSmk	2774	477	1304	637	356	17 (< 66)	47	23 (> 17)	13 (> 7)
	SBSdw1	11771	1185	8491	1908	187	10 (< 54)	72	16 (> 23)	2 (> 11)
	SBSmcl	865	14	315	417	119	2 (< 54)	36	48 (> 23)	14 (> 11)
		===== 15411	===== 1676	===== 10110	===== 2963	===== 661				
	Sub-Total	===== 18759	===== 2050	===== 12036	===== 3905	===== 768				

Mule Deer Winter Range: HORSEFLY\_RIVER

NDT1 ESSFwk1	16	0	16	0	0	0 (< 22)	100	0 (> 36)	0 (> 19)
	===== 16	===== 0	===== 16	===== 0	===== 0				
NDT2 ICHmk3	184	0	174	9	0	0 (< 36)	95	5 (> 31)	0 (> 9)
	===== 184	===== 0	===== 174	===== 9	===== 0				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT3									
SBSdw1	2249	50	1781	338	79	2 (< 54)	79	15 (> 23)	4 (> 11)
	=====	=====	=====	=====	=====				
	2249	50	1781	338	79				
	=====	=====	=====	=====	=====				
Winter Rge Total	2448	50	1971	348	79				
	=====	=====	=====	=====	=====				
Watershed Totals	21207	2100	14007	4252	848				

## WATERSHED: 16 - Tisdall Creek

NDT1									
ESSFwc3	366	74	54	237	1	20 (< 22)	15	65 (> 36)	0 (> 19)
ESSFwk1	1276	480	219	574	2	38 (< 22)	17	45 (> 36)	0 (> 19)
	=====	=====	=====	=====	=====				
	1642	554	274	811	3				
NDT2									
ICHmk3	1081	379	542	160	0	35 (< 36)	50	15 (> 31)	0 (> 9)
	=====	=====	=====	=====	=====				
	1081	379	542	160	0				
NDT3									
SBSdw1	3389	127	2605	469	186	4 (< 54)	77	14 (> 23)	5 (> 11)
SBSmc1	266	136	21	19	90	51 (< 54)	8	7 (> 23)	34 (> 11)

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
	=====	=====	=====	=====	=====				
	3655	264	2626	488	277				
	=====	=====	=====	=====	=====				
Watershed Totals	6378	1197	3441	1460	280				
WATERSHED: 17 - Moffat tributary									
NDT1									
ESSFwc3	317	36	0	208	73	11 (< 22)	0	65 (> 36)	23 (> 19)
ESSFwk1	4901	653	2086	2026	137	13 (< 22)	43	41 (> 36)	3 (> 19)
	=====	=====	=====	=====	=====				
	5219	689	2086	2233	210				
NDT3									
SBSmc1	3101	407	59	1883	752	13 (< 54)	2	61 (> 23)	24 (> 11)
	=====	=====	=====	=====	=====				
	3101	407	59	1883	752				
	=====	=====	=====	=====	=====				
Watershed Totals	8319	1096	2145	4116	962				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)				
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old	
WATERSHED: 18 -										
NDT1										
ESSFwk1	843	0	546	168	129	0 (< 22)	65	20 (> 36)	15 (> 19)	
	=====	=====	=====	=====	=====					
	843	0	546	168	129					
NDT3										
SBPSmk	2200	0	901	1079	220	0 (< 66)	41	49 (> 17)	10 (> 7)	
SBSdw1	2368	225	1762	245	137	9 (< 54)	74	10 (> 23)	6 (> 11)	
SBSmcl	625/2993	0	285	251	89	0 (< 54)	46	40 (> 23)	14 (> 11)	
	=====	=====	=====	=====	=====					
	5193	225	2948	1574	446					
	=====	=====	=====	=====	=====					
Watershed Totals	6036	225	3494	1743	574					

WATERSHED: 19 - Upper Woodjam Creek

NDT1										
ESSFwk1	491	45	353	94	0	9 (< 22)	72	19 (> 36)	0 (> 19)	
	=====	=====	=====	=====	=====					
	491	45	353	94	0					

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
NDT3									(>7)
SBPSmk	325	0	317	4	4	0 (< 66)	98	1 (> 17)	1 (> 1)
SBSmc1	437	15	386	35	0	3 (< 54)	88	8 (> 23)	0 (> 11)
	=====	=====	=====	=====	=====				
	762	15	703	40	4				
	=====	=====	=====	=====	=====				
Watershed Totals	1253	60	1056	134	4				

WATERSHED: 20 - Left bank tributary to Woodjam

Mule Deer Winter Range:

NDT1									
ESSFwk1	138	138	0	0	0	100 (< 22)	0	0 (> 36)	0 (> 19)
	=====	=====	=====	=====	=====				
	138	138	0	0	0				
NDT3									
SBPSmk	553	1	242	174	135	0 (< 66)	44	31 (> 17)	24 (> 7)
SBSmc1	558	205	317	23	13	37 (< 54)	57	4 (> 23)	2 (> 11)
	=====	=====	=====	=====	=====				
	1110	206	560	197	149				
	=====	=====	=====	=====	=====				
Watershed Totals	1249	344	560	197	149				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
WATERSHED: 21 -									
NDT1									
ESSFwc3	3975	397	786	1877	915	10 (< 22)	20	47 (> 36)	23 (> 19)
ESSFwk1	6557	1768	2967	1326	497	27 (< 22)	45	20 (> 36)	8 (> 19)
	=====	=====	=====	=====	=====				
	10532	2165	3752	3203	1412				
NDT3									
SBPSmk	22690	3183	7874	9977	1657	14 (< 66)	35	44 (> 17)	7 (> 7)
SBSdw1	1924	471	829	482	141	24 (< 54)	43	25 (> 23)	7 (> 11)
SBSdw2	279	52	187	41	0	19 (< 54)	67	15 (> 23)	0 (> 11)
SBSmc1	4648/6851	544	631	3458	15	12 (< 54)	14	74 (> 23)	0 (> 11)
	=====	=====	=====	=====	=====				
	29542	4251	9520	13958	1814				
NDT5									
AT	2	0	2	0	0	0 ( )	100	0 ( )	0 ( )
	=====	=====	=====	=====	=====				
	2	0	2	0	0				(-)
	=====	=====	=====	=====	=====				
Sub-Total	40076	6416	13274	17161	3225				
Mule Deer Winter Range: McINTOSH_LAKES									
NDT3									
SBPSmk	378	84	117	76	101	22 (< 66)	31	20 (> 17)	27 (> 7)

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.

HORSEFLY WATERSHED  
BIODIVERSITY ASSESSMENT  
(according to Biodiversity Field Guide, Nov. 16/94)

Biogeoclimatic Zone	Total Forested Area (ha)	Area (ha) per seral stage				Seral Stage Distribution % (required)			
		Early	"Grey"	Mature	Old	Early	"Grey"	Mature	Old
	=====	=====	=====	=====	=====				
	378	84	117	76	101				
	=====	=====	=====	=====	=====				
Winter Rge Total	378	84	117	76	101				
	=====	=====	=====	=====	=====				
Watershed Totals	40454	6499	13391	17237	3327				
	=====	=====	=====	=====	=====				
Final Totals	176903	41139	53570	66302	15893				

NOTE: The "Grey" zone includes everything that falls in between the early and mature stages; it has been included to give a better perspective of the distribution.