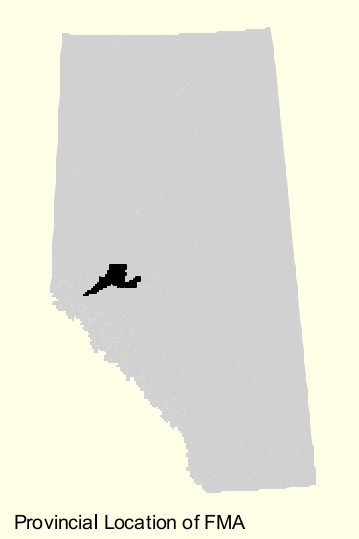
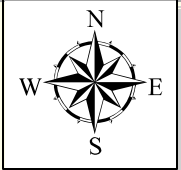


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ALBERTA NEWSPRINT COMPANY
 FOREST MANAGEMENT AGREEMENT AREA
RESIDUAL STRUCTURE (HABITAT Type 6)
 (1999) Potential for standing Dead Deciduous (Category IV)



CARIBOU ZONE

Fox Creek

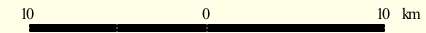
Two Creeks

Muskeg River

Stems per hectare classes

- 0
- 000-039
- 040-079
- 080-119
- 120+
- Not in harvest schedule
- ATS grid
- Recreation areas

Scale 1:425,000



Projection: Universal Transverse Mercator zone 11
 NAD 83 GRS 80
 83 metre file
 GDC project ref: 2000098
 Date: 08/20/01



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Twp 64
Twp 63
Twp 62
Twp 61
Twp 60
Twp 59
Twp 58
Twp 57
Twp 56
Twp 55

Twp 64
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Twp 56
Twp 55

Rge 5 Rge 4 Rge 3 Rge 2 Rge 1 6th MER Rge 27 Rge 26 Rge 25 Rge 24 Rge 23 Rge 22 Rge 21 Rge 20 Rge 19 Rge 18 Rge 17

- 0: zero stems per hectare
- 1. 0-249: greater than zero and less than 250 stems per hectare
- 2. 250-499: greater than or equal to 250 and less than 500 stems per hectare
- 3. 500-749: greater than or equal to 500 and less than 750 stems per hectare
- 4. 750+: greater than or equal to 750 stems per hectare

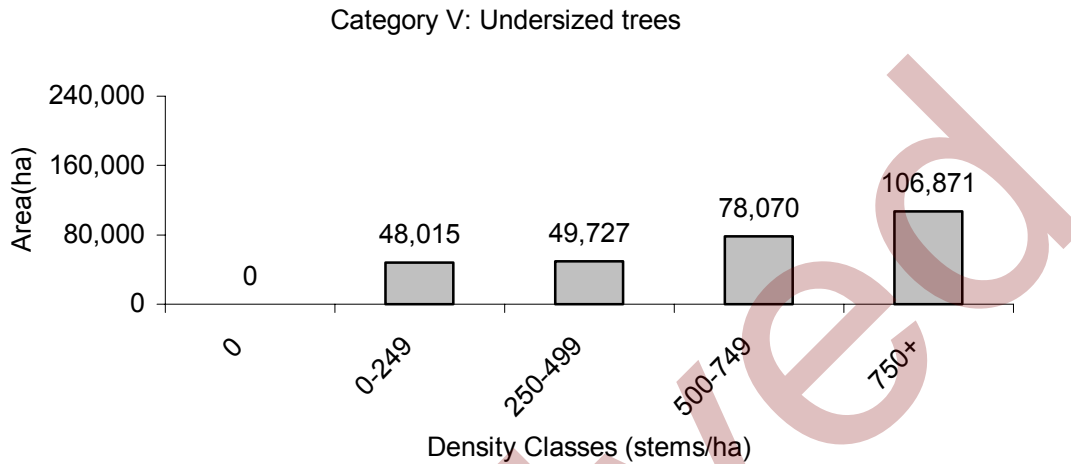


Figure 2.51 The FMA Area Summary for Category V

Figure 2.51 represents the FMA area summary for undersized trees. The entire landbase scheduled for harvest has the potential for leaving undersized trees. On average, about 106,871 ha (38%) of the landbase scheduled for harvest could yield greater than 750 stems per hectare of undersized trees, while 78,070 ha (28%) and 49,727 ha (17%) could yield 500 to 749 and 250 to 499 stems per hectare, respectively. Just over 83% of the area scheduled for harvest has potential for undersized trees greater than 250 stems per hectare.

Figure 2.52 shows the spatial distribution of habitat type 6, Category V.

2.3.6.7. Habitat Type 7 – Caribou Habitat

Caribou habitat is defined as all pure conifer ($\geq 80\%$ coniferous cover) greater than or equal to 80 years of age, as well as open and closed muskeg areas. For caribou habitat to be considered effective it must have limited fragmentation (i.e., must consist of large contiguous patches) and few linear disturbances. Road densities are also included as part of the caribou habitat model. The critical threshold for road densities was less than or equal to 0.3 km/km^2 . Using spatial analysis, stands (polygons) identified as caribou habitat were dissolved to continuous habitat patches. A 9-km^2 grid cell road-density model was integrated into the stand data. Using the model to identify stands that fell within the 0.3 km/km^2 threshold, habitat was eliminated from the final habitat description. These areas are quite visible in Figure 2.53 by the grid cell pattern among the caribou habitat that is colored in red. Dotted areas are faintly visible across the Caribou zone and they represent stands that are not in the harvest sequence. Patches greater than or equal to ten hectares are considered caribou habitat. Descriptive statistics (pie graphs)

for current (t=0) and future fragmentation characterization of caribou habitat is in section 4.3.7

Univariate statistics of caribou habitat in the Caribou Zone indicate that currently there are 306 patches with total area of 95,405 ha. The mean patch size is 312 ha, ranging between 10 and 20,923 ha with standard deviation of 1,730 ha. Fragmentation is low as greater than 50 percent of the total caribou habitat area is comprised of four patches.

The univariate statistics of patch edge to area ratio in the Caribou Zone are as follows: mean 0.0167 (m/m²), min 0.0022 (m/m²), max 0.0379 (m/m²), and standard deviation is 0.0067 (m/m²).

Figure 2.53 shows the spatial distribution of habitat type 7.

2.3.6.8. Habitat Type 8 – Grizzly Bear Habitat

Grizzly bear habitat was modeled for fall feeding season using a Habitat Suitability Index (HSI) model described by Heinrich et. al. (1996). "HSI models predict [and rate] habitat available for use by a species based on habitat structure, habitat type, and spatial arrangements between habitat features" (Heinrich et. al. 1996). Habitat availability is represented by a graphical function, or HSI, ranging between 0 and 1, where 0 indicates unsuitable habitat, and 1 indicates the most suitable habitat. HSI was evaluated at both a stand level and a 9-km² grid level.

Stand level HSI was calculated for each stand in ANC's FMA area using the following equation:

$$HSI = s1 * s2 * s3 * s4 * s5$$

Where HSI = Habitat Suitability Index and

s1, s2, s3, s4, and s5 = respective habitat components, or habitat variables chosen to represent grizzly bear fall feeding habitat. The assumptions used to account for the roads and areas of human activity in the model were also taken from Heinrich et al. 1996.

Habitat components are summarized in Table 2.40, along with response curve values (see Heinrich et. al. 1996 for respective graphical representations).

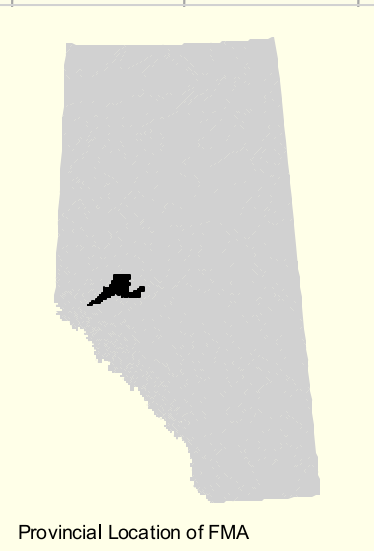
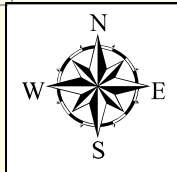
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RESIDUAL STRUCTURE (HABITAT Type 6)
(1999) Potential Undersized Trees (Category V)



Provincial Location of FMA

CARIBOU ZONE

Muskeg River

Fox Creek

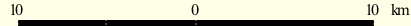
Two Creeks

Stems per hectare

- 0
- 000-249
- 250-499
- 500-749
- 750+
- Not in harvest schedule
- ATS grid
- Recreation areas

CARIBOU ZONE BOUNDARY

Scale 1:425,000



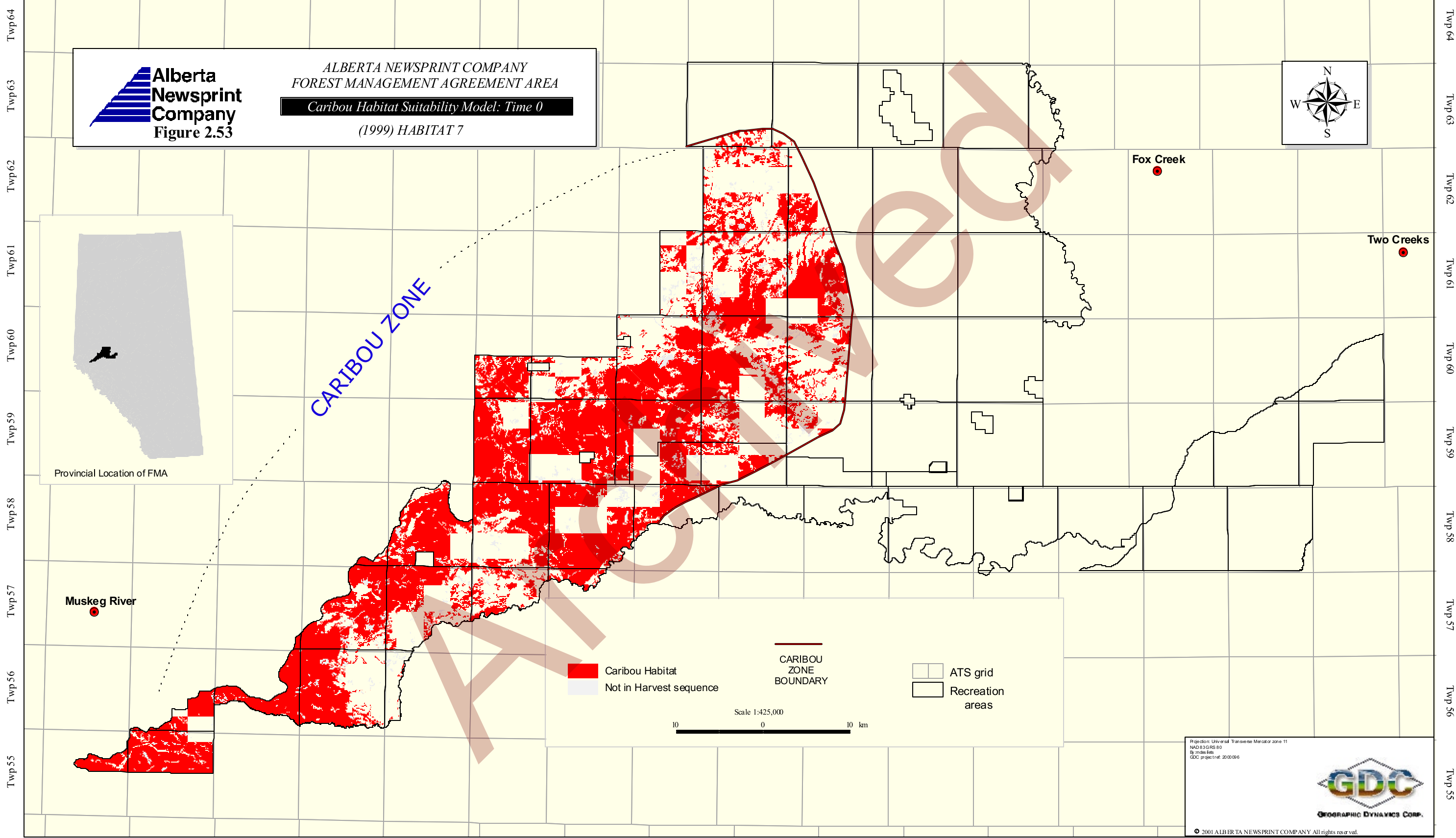
Projection: Universal Transverse Mercator zone 11
NAD 83 GRS 80
83 metre file
GDC project ref: 2000098
Date: 08/2001



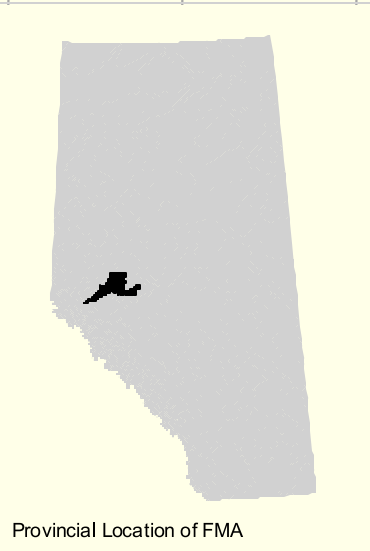
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 FOREST MANAGEMENT AGREEMENT AREA
Caribou Habitat Suitability Model: Time 0
 (1999) HABITAT 7



Provincial Location of FMA

CARIBOU ZONE

Muskeg River

Fox Creek

Two Creeks

- Caribou Habitat
- Not in Harvest sequence
- CARIBOU ZONE BOUNDARY
- ATS grid
- Recreation areas

Scale 1:425,000
 10 0 10 km

Projection: Universal Transverse Mercator zone 11
 NAD 83 GRS 80
 30 m x 30 m
 GDC project ref: 200008



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Rge 5 Rge 4 Rge 3 Rge 2 Rge 1 6th MER Rge 27 Rge 26 Rge 25 Rge 24 Rge 23 Rge 22 Rge 21 Rge 20 Rge 19 Rge 18 Rge 17

Twp 55 Twp 56 Twp 57 Twp 58 Twp 59 Twp 60 Twp 61 Twp 62 Twp 63 Twp 64

Table 2.40 Response Values for HSI Components.

Component		Control Value Class (x)	Response Value (s)
s1	Pine Composition (% cover)	0	0.40
		10	0.60
		20	0.80
		30+	1.00
s2	Shrubs (% Cover)	0	0.00
		5	0.50
		10+	1.00
s3	Canopy Closure (% cover)	71-100	0.00
		51-70	0.45
		31-50	0.75
		0-30	1.00
s4	Distance from Road (metres)	0-50	0.10
		50-100	0.30
		100-150	0.50
		150-200	0.70
		200-250	0.90
		250+	1.00
s5	Distance from human activity (metres)	0-2500	0.25
		2500-5000	0.75
		5000+	1.00

Note: All values in this table are taken from Heinrich et al. 1996 except for s3, s4 and s5 where the midpoint values in the control class range were assigned the indicated response value in order to capture the discrete class structure.

Each stand was assigned one of the following four HSI classes:

1. 0: Zero
2. 0-.4: Greater then zero and less than 0.4
3. 0.4-0.7: Greater then or equal to 0.4 and less than 0.7
4. 0.7-1: Greater then or equal to 0.7 and less than or equal to 1

The grid level evaluation summarized HSI from the stand level to a 3 by 3 km (9 km²) grid cell level. As well, a sixth component (s6) was included in HSI model. This component represented road density (km/km²) values calculated for each grid cell and was defined as a discrete variable. The response values for s6 were: 1 if road density was less then or equal to 0.3 km of road per km²; or 0 if road density was greater then 0.3 km or road per km². The current areas in each of the habitat suitability classes are the following:

- For the habitat value of 0, the area is 172,247 hectares (45.5%)
- For the habitat value of 0.0 to 0.39, the area is 106,542 hectares (28.1%)
- For the habitat value of 0.4 to 0.69, the area is 83,069 hectares (21.9%)
- For the habitat value of 0.7 to 1.0, the area is 16,867 hectares (4.5%)

Figure 2.54 and Figure 2.55 summarize the results for habitat type 8.

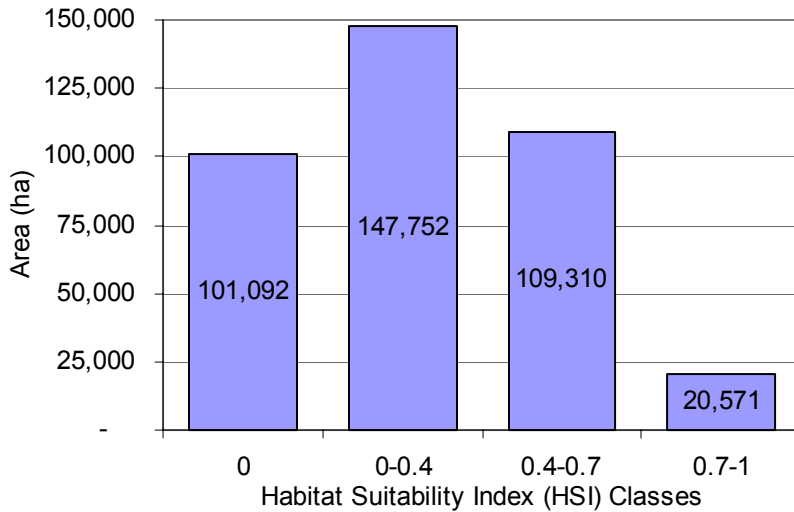


Figure 2.54 Current Area Summary of Grizzly Bear Habitat Suitability Index in the FMA Area, without the 9 km² grid cell (i.e., only s1 + s2 + s3 + s4 + s5)

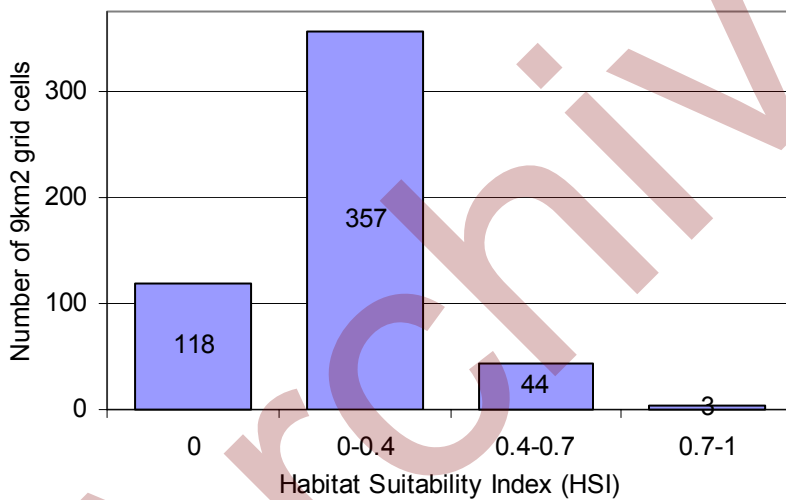


Figure 2.55 Number of Cells Summary of Grizzly Bear Habitat Suitability Index in the FMA Area, by 9-km² Grid Cells.

FMA area summarized HSI by distribution is normally distributed and centered on '0-0.4' HSI class, which covers 147,752 ha (39.0%). In addition, there are 101,092 ha (26.7%) of current area rated as unsuitable grizzly bear habitat (HSI = 0), 109,310 ha (28.9%) of '0.4-0.7' HSI class, and 20,571 ha (5.4%) of the most suitable habitat type (HSI = '0.7-1'). Grizzly bear habitat area summarized using 9-km² grid cells indicates similar patterns with exception of the most suitable habitat areas. The most suitable habitat area covers only three 9-km² grid cells or 0.6% of the entire area. Most of the area is shifted to '0-0.4' HSI class, which has 357 cells (68.4%).

Figure 2.56 shows the spatial distribution of habitat type 8 according to the fall feeding model. Figure 2.57 shows the spatial distribution of the 9-km² grid cell model.