

ADDENDUM NUMBER I
CATALOGUE OF DEN SITES
TO
BASE DATA REPORT
SECTION D - MACKENZIE HIGHWAY
MILES 715 TO 936



October 1974



FOR
DEPARTMENT OF PUBLIC WORKS OF CANADA
Edmonton, Canada

BY



SCHULTZ

C.D. SCHULTZ & COMPANY LIMITED
FORESTERS AND CONSULTING ENGINEERS
ECONOMISTS AND BIOLOGICAL SCIENTISTS

VANCOUVER, CANADA
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Integrated Resource Development

Environmental Impact Studies

325 HOWE STREET, VANCOUVER, CANADA V6C 2A1

October 28, 1974
Our File: CG170.3.5

Mr. F.E. Kimball
Project Manager, N.W.T. Roads
D.P.W. Western Region
P.O. Box 488
Edmonton, Alberta
T5J 2K1

Dear Mr. Kimball:

In accordance with Mr. Hucluk's telephone conversation of September 16, 1974, Addendum I (Den Sites), to the Base Data Report for Section D of the Mackenzie Highway, has been completed.

If you have any questions pertaining to this addendum, please contact this office.

Thank you.

Yours truly,

SCHULTZ INTERNATIONAL LIMITED

Dr. L.W. Mottus
Manager, Environmental Studies

LWM:lf

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1.0 INTRODUCTION

During the summers of 1973 and 1974 records were made of 29 mammal denning sites located between Fort Good Hope and Inuvik in the vicinity of the Mackenzie River. The locations of denning sites were derived from comments of local trappers, sitings made by archaeological field crews and from sitings obtained during fixed wing and helicopter surveys. Table 1 presents a brief description of these denning sites. Their approximate locations are marked on maps, Figure 1 and 2. During July 1974 a detailed investigation and photographic documentation of 14 of these sites was performed. Appendix I presents the results of this examination.

Tentative identification of dens was generally based on consideration of the size of the den, presence of identifying sign (tracks, feces, etc.) or from information provided by native trappers. Twenty-four of the den sites located were identified as possible black bear dens, one was felt to possibly represent a grizzly denning site, two appeared to be wolf denning sites and one was that of a fox. An area of numerous small burrows, possibly rabbit, was also located.



TABLE 1 - Den Site Descriptions & Locations 1974

Map Ref.	1974 Status	Den Type	Approximate Location	Exposure	Located by
1	Not checked	Bear	Rabbit Hay River	S.E.	Trapper
2	Not checked	Bear	Rabbit Hay River	E	Trapper
3	Not checked	Bear	Rat Lake River (exit)	S.W.	Trapper
4 & 5	Not found	Bear	Thunder River (South Bank)	?	Archaeologists
6	Relocated	Bear	Thunder River (South Bank)	S, S.W.	Aerial survey
7	Relocated	Bear	Thunder River (South Bank)	S, S.W.	Aerial survey
8	New location	Bear	Thunder River (North Bank)	W, S.W.	Aerial survey
9	Not found	Bear	Thunder River (North Bank)	S.W.	Aerial survey
10	Not found	Bear	Thunder River (North Bank)	E	Aerial survey
11	New location	Bear	Thunder River (North Bank)	S, S.W.	Aerial survey
12	Relocated	Bear	Mile 803	N.E.	Ground survey
13	Not found	Bear	Payne Creek	S.E.	Aerial survey
14	New location	Bear	Banks of Mackenzie, South of Tieda	S.W.	Aerial survey
15	Not checked	Bear	West Bank of Mackenzie, 10 mi. North of Loon River	?	Trapper
16	Not checked	Bear	Banks of Mackenzie, North of Loon Rv.	S.W.	Aerial survey
17	Not checked	Bear	Mouth of Loon River	?	Trapper
18	Not checked	Bear	Mouth of Loon River	S.W.	Aerial survey
19	Not checked	Bear	Banks of Mackenzie, 5 mi. South of Loon River	S.W.	Trapper
20	Not found	Bear	Esker North of Stream 1.152	S.	Aerial survey
21	Relocated	Bear	South Banks of Stream 1.152	S.	Aerial survey
22	Not checked	Wolf	South end of Foot Lake	W	Ground survey
23	Not checked	Fox	West of Kame Lake	S	Ground survey



Table 1 - Continued

Map Ref.	1974 Status	Den Type	Approximate Location	Exposure	Located by
24	New Den	Wolf	West of Kame Lake	W, S.W	Aerial survey
25	New Den	Bear	100 yards West of Road 1/2 mile North of Stream No. 1.148.01.02	S	Ground survey
26	New Den	Bear	Stream No. 1.152 (North Bank)	S.E.	Aerial survey
27	New Den	Rabbits?	North of Payne Creek near Stream No. 1.128.04	S, S.W	Aerial survey
28	New Den	Bear	Thunder River (North Bank)	S, S.E.	Aerial survey
29	New Den	Bear	Thunder River (North Bank)	S.W.	Aerial survey



2.0 DENNING CRITERIA

Typically, dens were located on the upper half of southerly exposed open or semi-open slopes along the banks of water-courses or on drumlins and eskers. The occurrence of permafrost is undoubtedly the major limiting factor in deciding the availability of denning sites in this area. Within the restrictions imposed by permafrost the location of dens is probably further determined by exposure, nature of the soil, and availability of foraging area.

The potential denning site must receive sufficient radiation during the summer to ensure a deep active layer in which the den can be dug in the fall. On slopes with a northern exposure, permafrost may occur just beneath the layer of insulative mosses. Slopes with a southerly exposure, however, receive considerably more summer radiation and consequently tend to have deeper active layers making them more suitable for den sites. The deepest depth of the active layer would be expected along the top of the slope where the greatest amount of radiation would be received. The exposure of the potential site must, in addition, provide for a sufficient depth of snow accumulation in the winter to insulate the den chamber. Through the study area the prevailing winds tend to blow from the north (B.M. Burns and Atmospheric Services of DOE) and snow consequently accumulates on southern exposures.

The nature of the soil at the denning site must have a low water retention rate and hence be permeable to water. In northern areas a high water content during freeze-up could result in frost heaving and soil expansion sufficient to cause collapse of the site. Vegetation on located sites tended towards either



a low growing shrub association (bearberry, crowberry predominantly) with an absence of coniferous trees or an open deciduous tree - low growing shrub association, both of which are indicative of dry, well drained conditions. Soils in these areas tended to be of a sorted sand-clay mixture with small stones occasionally present.

Generally from the condition of observed sites it would appear that den sites are not reused from year to year. Craighead & Craighead (1972) found some evidence that occasionally grizzly bears may reuse a previous year's den. More frequently though another den would be dug in the same area.

Craighead & Craighead found that grizzlies tended to den in seclusion relatively far from areas of human activity. The same principle likely applies to black bears. Disturbance due to winter construction activities could cause bears to abandon den sites. This could be particularly critical in the case of a female with newborn cubs. Whether a displaced bear could find an alternative site is not known, definitely the chances would be reduced after the onset of freezing and most likely the bear would be forced to utilize a less suitable spot such as a windfall or natural cavity.




3.0 DATA SHEETS



DATE: July 4, 1974

- 7 -

DATA SHEET - DENS

DEN TYPE BearLOCATION: AREA Thunder River - tributaryMAP REF. NO. #6MAP SHEET Travaillant (106 0)CONDITION : Same condition as 1973. Appears usable. Possibly bedding material inside.ANGLE OF SLOPE ~35°EXPOSURE: DEN S to SWSLOPE S to SWOPENING SIZE  (ht) ----- (open) (w) -----INTERIOR SIZE  (w) ----- (open) (l) ----- (ht) -----

TEMP: INTERIOR

C° -----

EXTERIOR

C° -----

SOIL: WALL

C° -----FLOOR. C° -----VEGETATION: Entrance partially hidden by low shrub. Tailing pile revegetated only slightly.SLOPE open; low shrub (crowberry), grassesDISTANCE TO COVER ~50DIRECTION TO COVER allCOVER TYPE dense spruceSOIL SAMPLE # -----PHOTOGRAPHS: ROLL 1 FRAME 0-4,24

DATE: July 4, 1974

- 9 -

DATA SHEET - DENS

DEN TYPE BearLOCATION: AREA Thunder River - north bankMAP REF. NO. #8MAP SHEET (Travaillant River 106 O)CONDITION : Same condition as 1973. Collapsed, interior visible.Located on a small slope high on banks.ANGLE OF SLOPE ~45°EXPOSURE: DEN W to SWSLOPE W to SW

OPENING SIZE



(ht)



(w)

INTERIOR SIZE



(w)



(l)



(ht)

TEMP: INTERIOR

C°

EXTERIOR

C°

SOIL: WALL

C°

FLOOR

C°

VEGETATION: Tailing pile partially revegetated.SLOPE open; sparse low shrub (crowberry) grassesDISTANCE TO COVER 5'DIRECTION TO COVER allCOVER TYPE dense spruceSOIL SAMPLE # -----PHOTOGRAPHS: ROLL 1 FRAME 8,9,10

DATE: July 4, 1974

- 10 -

DATA SHEET - DENS

DEN TYPE Bear

LOCATION: AREA Thunder River

MAP REF. NO. #11

MAP SHEET Travaillant (106 0)

CONDITION : Same condition as 1973. Appears shallow. Bedding material possibly present.

ANGLE OF SLOPE GT 45°

EXPOSURE: DEN S to SW

SLOPE S to SW

OPENING SIZE



(ht)

(open)



(w)

INTERIOR SIZE



(w)

(open)



(l)

↑ (ht)

TEMP: INTERIOR

C°

EXTERIOR

C°

SOIL: WALL

C°

FLOOR

C°

VEGETATION: Tailing pile slightly revegetated.

SLOPE open; grasses, low shrub (crowberry, bearberry)

DISTANCE TO COVER 10'




DIRECTION TO COVER NW

COVER TYPE spruce

SOIL SAMPLE # -----




PHOTOGRAPHS: ROLL 1 FRAME 11, 12, 13, 22, 23

DATA SHEET - DENS

DEN TYPE BearLOCATION: AREA West of Kane LakeMAP REF. NO. #12MAP SHEET Travaillant Lake (106 0)CONDITION : Same condition as in 1973. Not reused. Some caving
in from top above entrance. Bedding material (straw) present.ANGLE OF SLOPE ~40°EXPOSURE: DEN NESLOPE EOPENING SIZE  (ht) 1'7" (w) 3'2"INTERIOR SIZE  (w) 3'10" (l) 5'4"  (ht) 1'10"TEMP: INTERIOR $^{\circ}\text{C}$ 14.6EXTERIOR $^{\circ}\text{C}$ 19.SOIL: WALL $^{\circ}\text{C}$ ---FLOOR $^{\circ}\text{C}$ 5.5VEGETATION: Located at base of standing dead spruce.SLOPE grass, med. ht. shrubs, open spruce & dead deciduousDISTANCE TO COVER all aroundDIRECTION TO COVER all aroundCOVER TYPE open spruce, dead birch (fire killed)SOIL SAMPLE # ✓PHOTOGRAPHS: ROLL 2 FRAME 21-24

DATE: July 5, 1974

DATA SHEET - DENS

DEN TYPE BearLOCATION: AREA West of Eagle FallsMAP REF. NO. #14 (relocated slightly west)MAP SHEET Ft. Good Hope (106 I)CONDITION : Same condition as 1973. Appears usable. Small den
(fox?) upslope.ANGLE OF SLOPE 50°EXPOSURE: DEN SWSLOPE SWOPENING SIZE  (ht) ----- (open) (w) -----INTERIOR SIZE  (w) ----- (open) (l) -----

↑

(ht) -----

TEMP: INTERIOR

C° -----

EXTERIOR

C° -----

SOIL: WALL

C° -----

FLOOR

C° -----VEGETATION: Tailings pile slightly revegetatedSLOPE open; grasses, low shrubDISTANCE TO COVER 30'DIRECTION TO COVER SWCOVER TYPE dense spruceSOIL SAMPLE # -----

PHOTOGRAPHS: ROLL

2

FRAME

7-10

DATE: July 31, 1973

- 13 -

DATA SHEET - DENS

DEN TYPE Bear

LOCATION: AREA East bank of Mackenzie River, north of Loon River

MAP REF. NO. #16


MAP SHEET Ft. Good Hope (106 I)


CONDITION : Appears usable.


ANGLE OF SLOPE 45°


EXPOSURE: DEN SW

SLOPE SW

OPENING SIZE  (ht) _____

 (w) _____

INTERIOR SIZE  (w) _____

 (l) _____



(ht) _____

TEMP: INTERIOR C°

EXTERIOR C°

SOIL: WALL C°

FLOOR C°

VEGETATION: Tailing pile not revegetated.

SLOPE open; low shrubs (crowberry & bearberry), grass

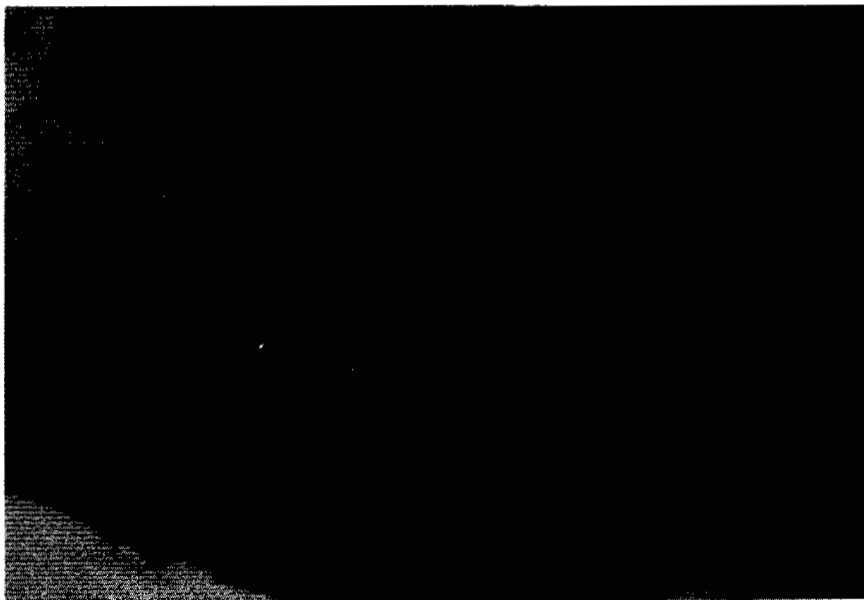
DISTANCE TO COVER 25'

DIRECTION TO COVER west

COVER TYPE closed spruce

SOIL SAMPLE # -----

PHOTOGRAPHS: ROLL S-10 FRAME #7 (slide cat. #942)



PHOTOGRAPH OF INTERIOR OF DEN AT SITE NUMBER 21.



PHOTOGRAPH OF CLAW MARKS ON INTERIOR WALL OF DEN
SITE NUMBER 21.








DATE: July 5, 1974

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DATA SHEET - DENS

DEN TYPE BearLOCATION: AREA stream 1.152MAP REF. NO. #21MAP SHEET Ft. Good Hope (106 I)CONDITION : Same condition as 1973. Located on South bank at top of slope.ANGLE OF SLOPE GT 60°EXPOSURE: DEN SSLOPE SW

OPENING SIZE	 (ht)	<u>2'</u>
	 (w)	<u>1'-10'</u>
INTERIOR SIZE	 (w)	<u>2'-10'</u>
	 (l)	<u>6'</u>
		 (ht) <u>2'6"</u>
TEMP: INTERIOR	C°	<u>11.2</u>
EXTERIOR	C°	<u>21.5</u>
SOIL: WALL	C°	<u>7.5</u>
FLOOR	C°	<u>5.2</u>

VEGETATION: Located at base of tall willow. Tailing pile slightly revegetated with grass.SLOPE open; grasses, scattered lowshrubDISTANCE TO COVER 10'DIRECTION TO COVER northCOVER TYPE poplar & spruceSOIL SAMPLE # -----PHOTOGRAPHS: ROLL 1/2 FRAME 35,36,37/1,2,3

DATE: July 5, 1974

DATA SHEET - DENS

DEN TYPE Possible wolf or bear

LOCATION: AREA West of Kame Lake

MAP REF. NO. #24


MAP SHEET Travaillant Lake (106 0)


CONDITION : Den appears usable.

ANGLE OF SLOPE ~45°


EXPOSURE: DEN W to SW

SLOPE W to SW

OPENING SIZE  (ht) ----- (open)

 (w) -----

INTERIOR SIZE  (w) ----- (open)

 (l) -----

 (ht) -----

TEMP: INTERIOR

C° -----

EXTERIOR

C° -----

SOIL: WALL

C° -----

FLOOR

C° -----

VEGETATION: Entrance slightly hidden by overhanging vegetation.

Tailing pile not revegetated.

SLOPE open; grasses, low shrubs

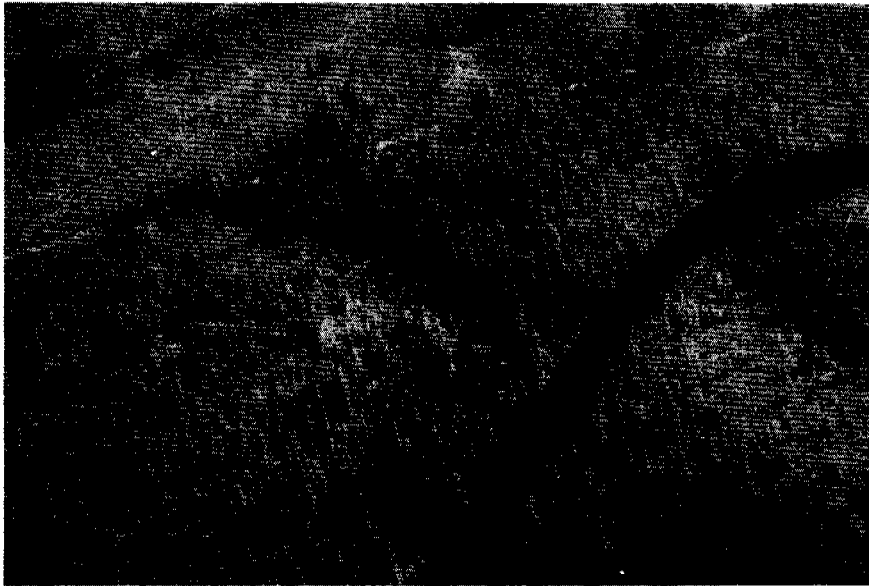
DISTANCE TO COVER ~75'

DIRECTION TO COVER south

COVER TYPE open spruce, some birch

SOIL SAMPLE # -----

PHOTOGRAPHS: ROLL 2 FRAME 17-20



PHOTOGRAPH 3 - DEN SITE NUMBER 25 - GENERAL AREA



DATE: July 5, 1974

- 16 -

DATA SHEET - DENS

DEN TYPE BearLOCATION: AREA Vicinity of Stream 1.148.01.02MAP REF. NO. #25MAP SHEET Ft. Good Hope (106 I)CONDITION : on the end of a small esker-like feature 100 yards west of road. Den appears of recent construction.ANGLE OF SLOPE 10 - 15°EXPOSURE: DEN SSLOPE S

OPENING SIZE



(ht)

2'

(w)

1'9"

INTERIOR SIZE



(w)

3'10"

(l)

4'

(ht)

1'11'

TEMP: INTERIOR

C°

12.0

EXTERIOR

C°

16.5

SOIL: WALL

C°

--

FLOOR

C°

5VEGETATION: Located at base of 20' spruce. Tailing pile not revegetatedSLOPE open; low shrub, grassesDISTANCE TO COVER 10'DIRECTION TO COVER westCOVER TYPE open deciduous / dense spruce

SOIL SAMPLE #

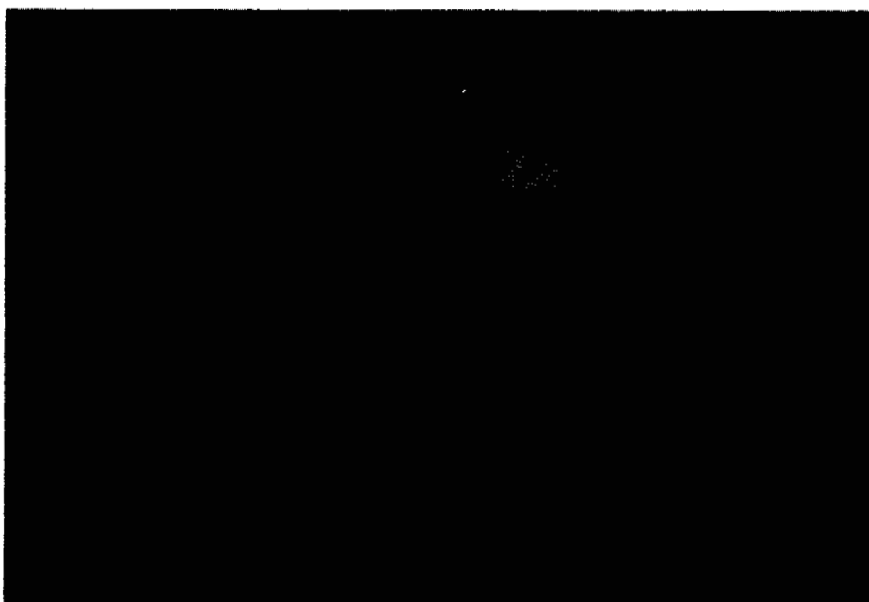
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PHOTOGRAPHS: ROLL

1

FRAME

31,32,33



PHOTOGRAPH 3 - DEN SITE NUMBER 27



DATE: July 5, 1974

- 18 -

DATA SHEET - DENS

DEN TYPE Rabbit / possibly bear also

LOCATION: AREA north of Payne Creek

MAP REF. NO. #27


MAP SHEET Ft. Good Hope (106 I)

CONDITION : 2 large openings, approximately ten smaller ones on drumlin-like feature. (Two hares seen in immediate vicinity during fly-over).


ANGLE OF SLOPE ~30°


EXPOSURE: DEN S to SW

SLOPE S to SW

OPENING SIZE  (ht) ----- (open)

 (w) -----

INTERIOR SIZE  (w) ----- (open)

 (l) ----- ↑ (ht) -----

TEMP: INTERIOR $^{\circ}\text{C}$ -----

EXTERIOR $^{\circ}\text{C}$ -----

SOIL: WALL $^{\circ}\text{C}$ -----

FLOOR $^{\circ}\text{C}$ -----

VEGETATION: -----

SLOPE open; grasses, bearberry

DISTANCE TO COVER 20'

DIRECTION TO COVER South

COVER TYPE open spruce

SOIL SAMPLE # -----

PHOTOGRAPHS: ROLL 2 FRAME 11-16

DATE: July 4, 1974

- 19 -

DATA SHEET - DENS

DEN TYPE Bear

LOCATION: AREA Thunder River - north bank

MAP REF. NO. #28

MAP SHEET Travaillant (106 0)


CONDITION : Located at base of spruce. Den appears of recent construction.

ANGLE OF SLOPE GT 50°



EXPOSURE: DEN S to SE

SLOPE S to SE

OPENING SIZE  (ht) ----- (open)

 (w) -----

INTERIOR SIZE  (w) ----- (open)

 (l) -----  (ht) -----

TEMP: INTERIOR C° -----

EXTERIOR C° -----

SOIL: WALL C° -----

FLOOR C° -----

VEGETATION: At base of 75' live spruce. Tailing pile not revegetated.

SLOPE open; low shrub (crowberry)

DISTANCE TO COVER 25-30'

DIRECTION TO COVER north

COVER TYPE dense spruce

SOIL SAMPLE # -----

PHOTOGRAPHS: ROLL 1 FRAME 19 - 21

DATE: July 4, 1974

- 20 -

DATA SHEET - DENS

DEN TYPE Possibly Bear

LOCATION: AREA Thunder River - tributary

MAP REF. NO. #29

MAP SHEET Travaillant (106 0)


CONDITION : Small slope. Den appears collapsed. Bedding material possibly present. Den under a fallen log.


ANGLE OF SLOPE GT 55°



EXPOSURE: DEN SW

SLOPE SW

OPENING SIZE  (ht) -----

 (w) -----

INTERIOR SIZE  (w) -----

 (l) -----  (ht) -----

TEMP: INTERIOR C° -----

EXTERIOR C° -----

SOIL: WALL C° -----

FLOOR C° -----

VEGETATION: Tailing pile not revegetated.

SLOPE open; low shrubs (crowberry, bearberry)

DISTANCE TO COVER 5'

DIRECTION TO COVER N

COVER TYPE spruce

SOIL SAMPLE # -----

PHOTOGRAPHS: ROLL 1 FRAME 14 - 18

APPENDICES



APPENDIX I
REFERENCES CITED



APPENDIX I
References Cited

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APPENDIX I

REFERENCES CITED



APPENDIX II

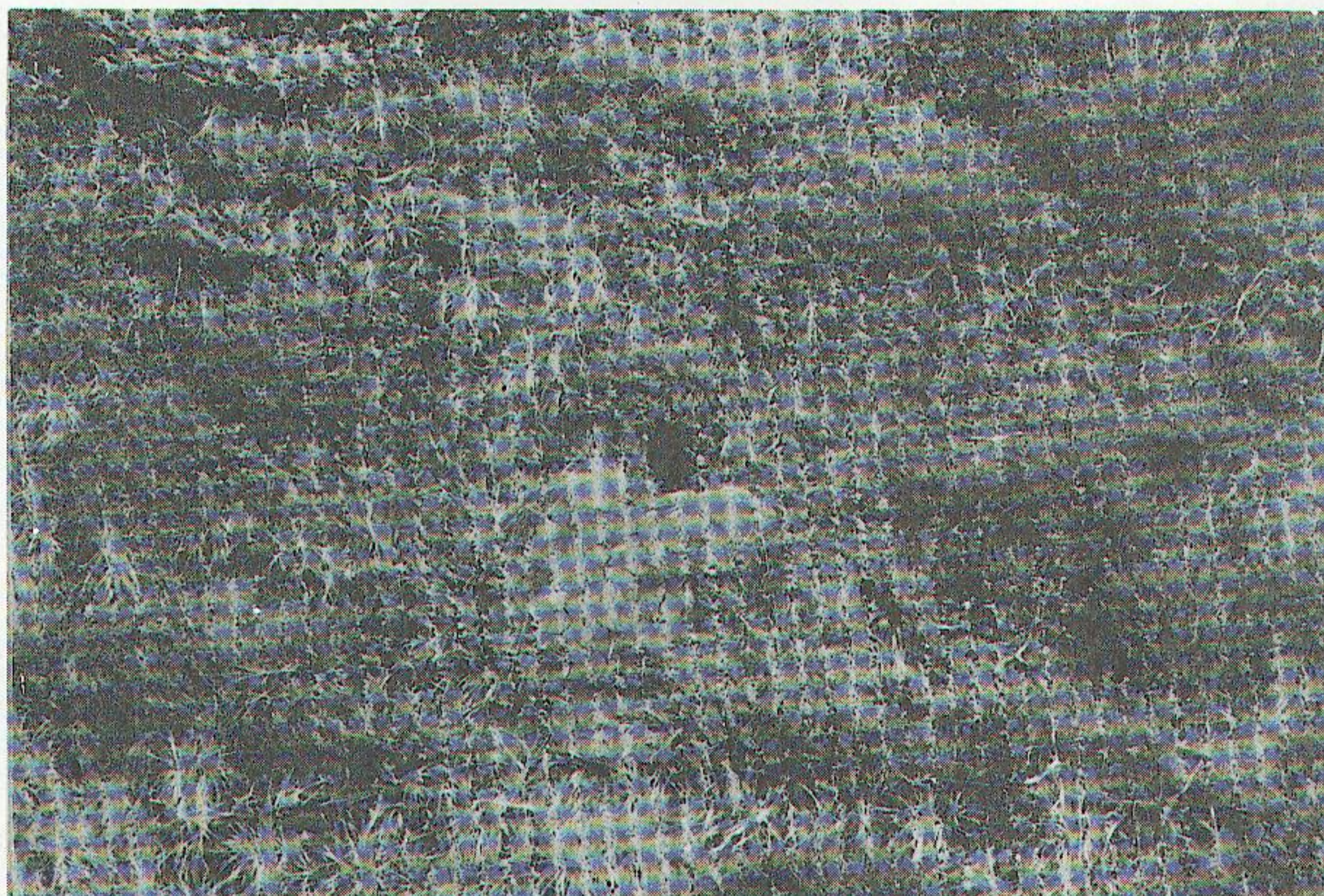
LOCATION MAPS

FIGURES 1 AND 2





PHOTOGRAPH 1 - DEN SITE NUMBER 6.



PHOTOGRAPH 2 - DEN SITE NUMBER 6





PHOTOGRAPH OF DEN SITE NUMBER 7



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PHOTOGRAPH OF DEN SITE NUMBER 8





PHOTOGRAPH 1 -
DEN SITE NUMBER
11.



PHOTOGRAPH 2 - DEN SITE NUMBER 11



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PHOTOGRAPH 1 - DEN SITE NUMBER 12.



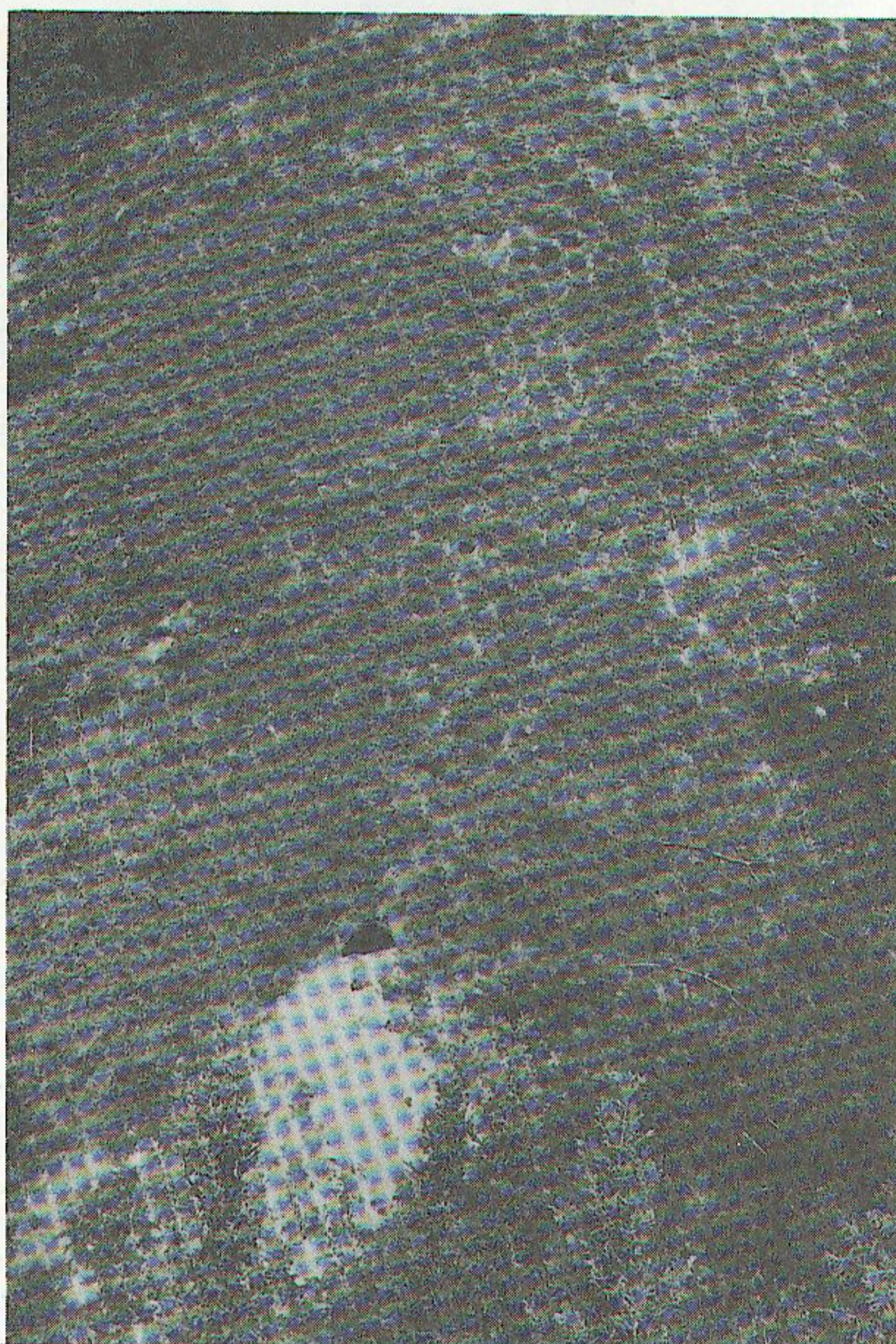
PHOTOGRAPH 2 - DEN SITE NUMBER 12.



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PHOTOGRAPH 1 - DEN SITE NUMBER 14.



PHOTOGRAPH 2 - DEN
SITE NUMBER 14.





PHOTOGRAPH 1 - DEN SITE NUMBER 16



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PHOTOGRAPH 1 - DEN SITE NUMBER 21.



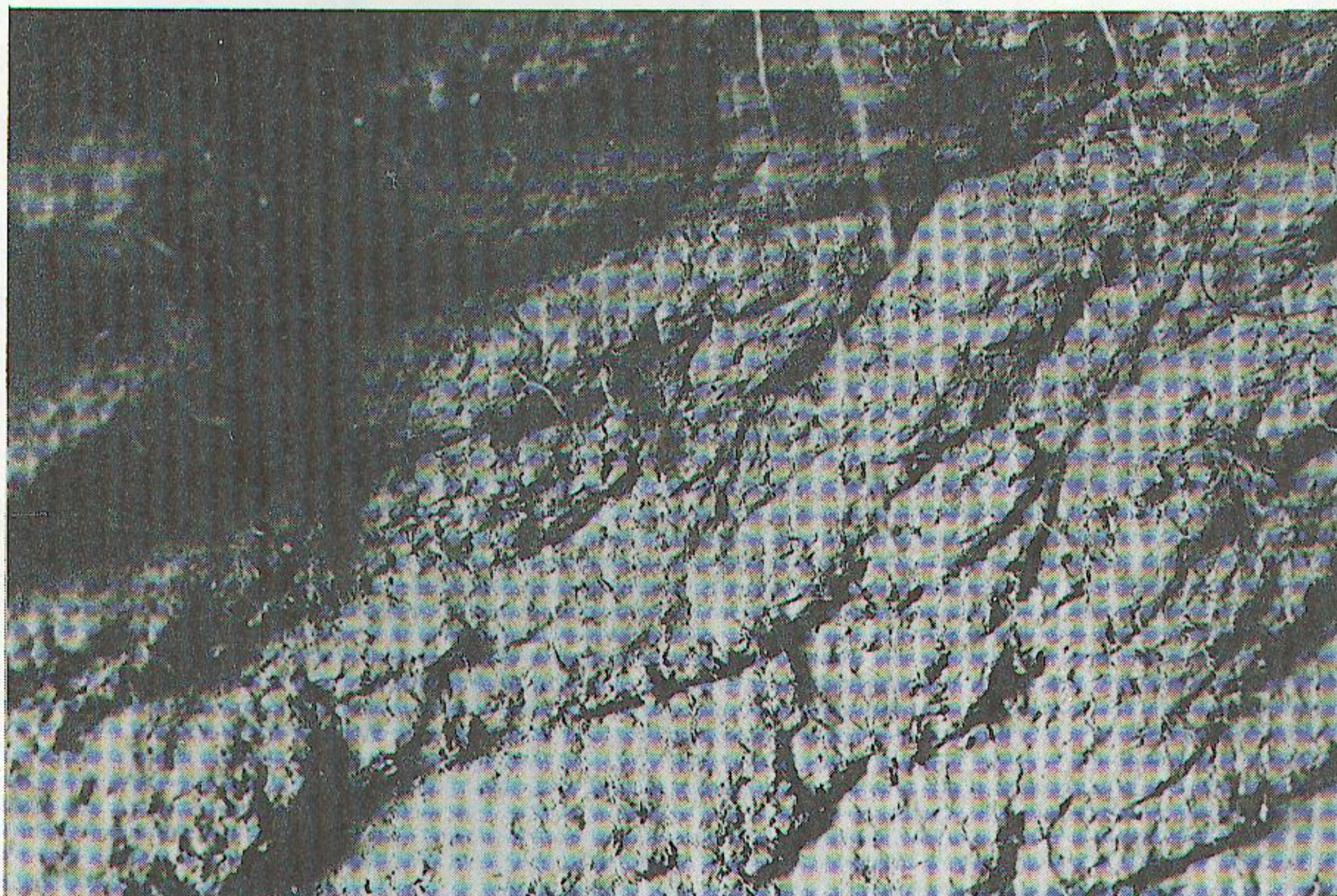
PHOTOGRAPH 2 - DEN SITE NUMBER 21.



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PHOTOGRAPH OF INTERIOR OF DEN AT SITE NUMBER 21.



PHOTOGRAPH OF CLAW MARKS ON INTERIOR WALL OF DEN
SITE NUMBER 21.





PHOTOGRAPH 1 - DEN SITE NUMBER 24.



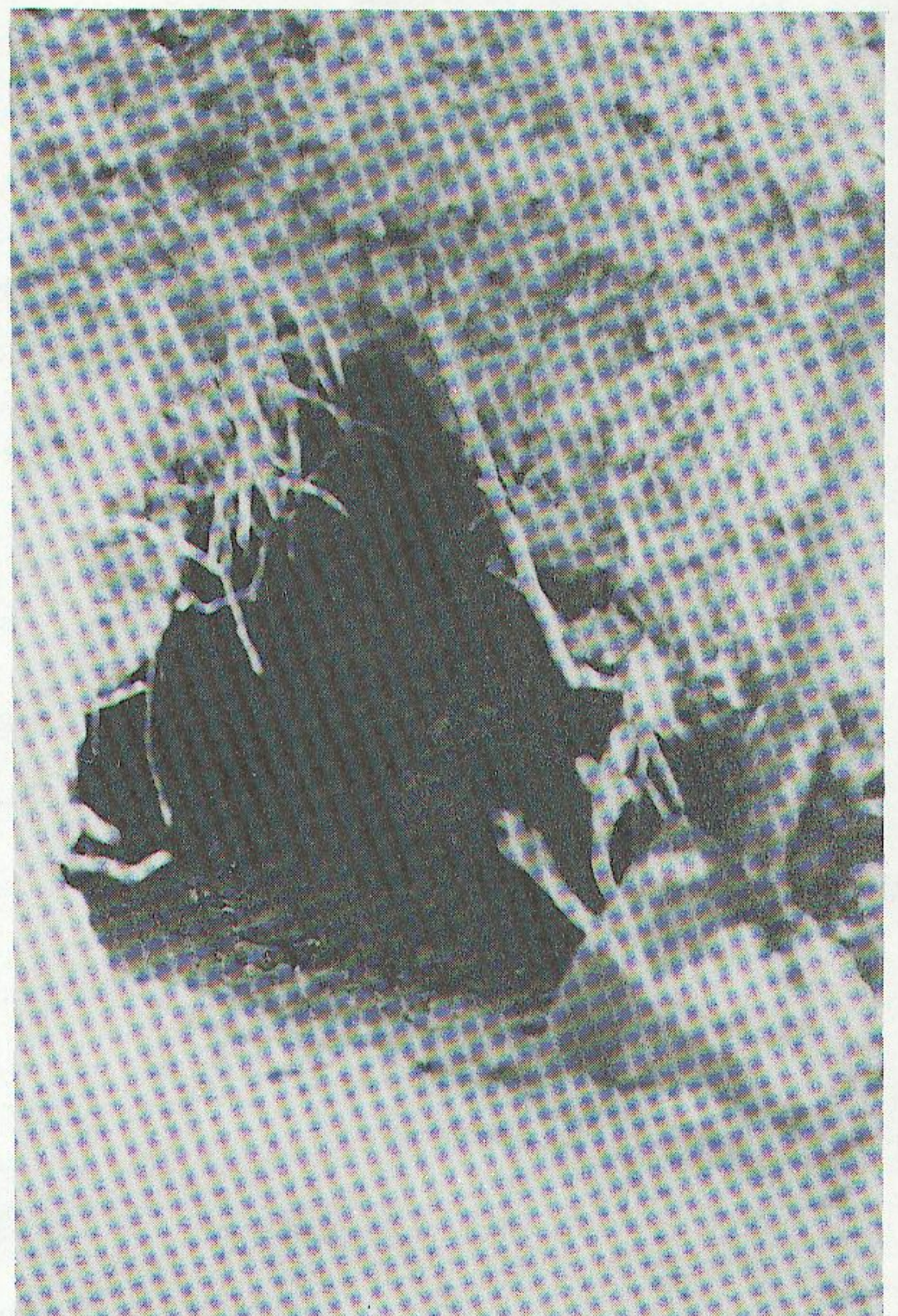
PHOTOGRAPH 2 - DEN
SITE NUMBER 24.





PHOTOGRAPH 1 - DEN
SITE NUMBER 25

PHOTOGRAPH 2 - DEN
SITE NUMBER 25.

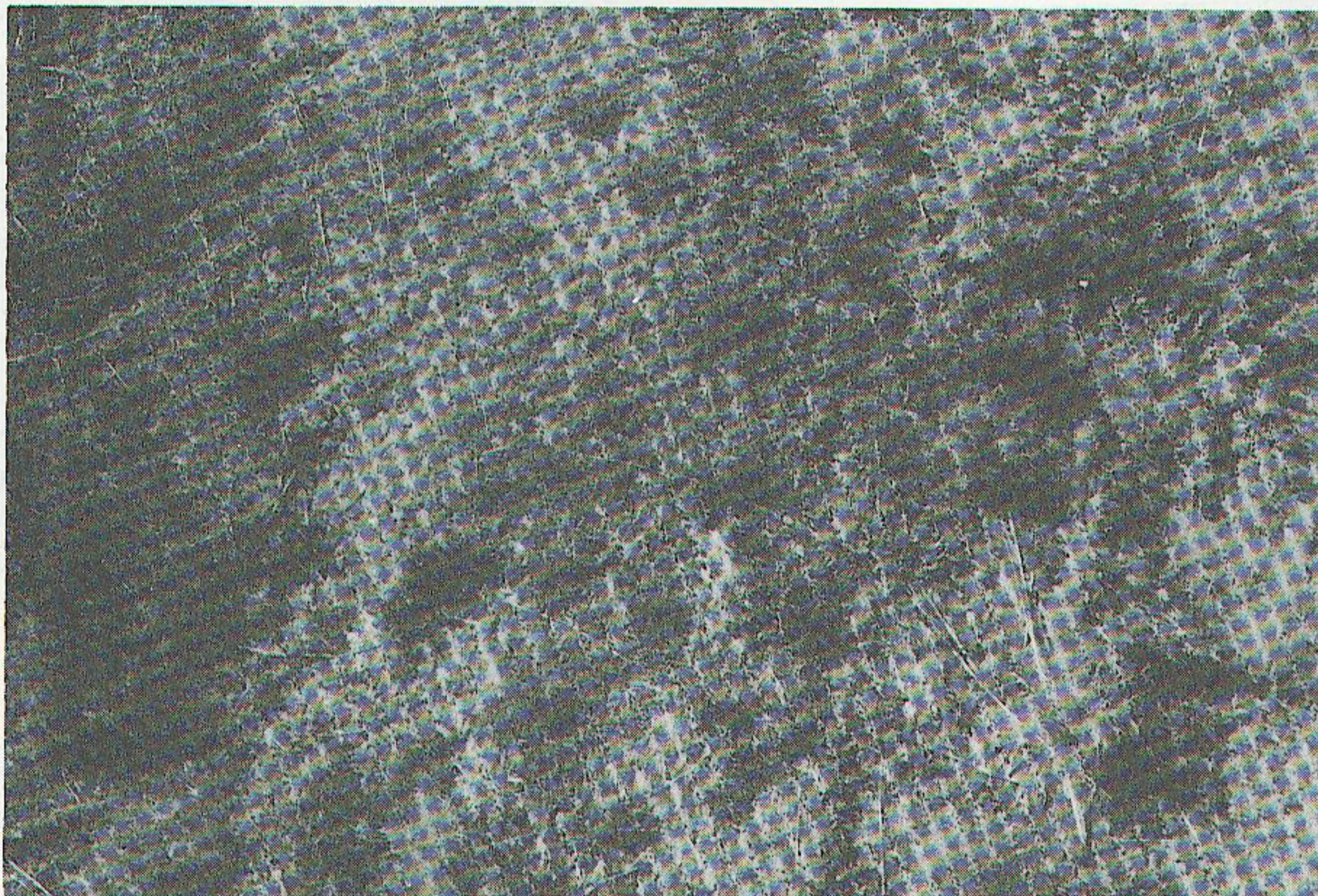




PHOTOGRAPH 3 - DEN SITE NUMBER 25 - GENERAL AREA



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PHOTOGRAPH OF DEN SITE NUMBER 26





PHOTOGRAPH 1 - DEN SITE NUMBER 27.



PHOTOGRAPH 2 - DEN SITE NUMBER 27

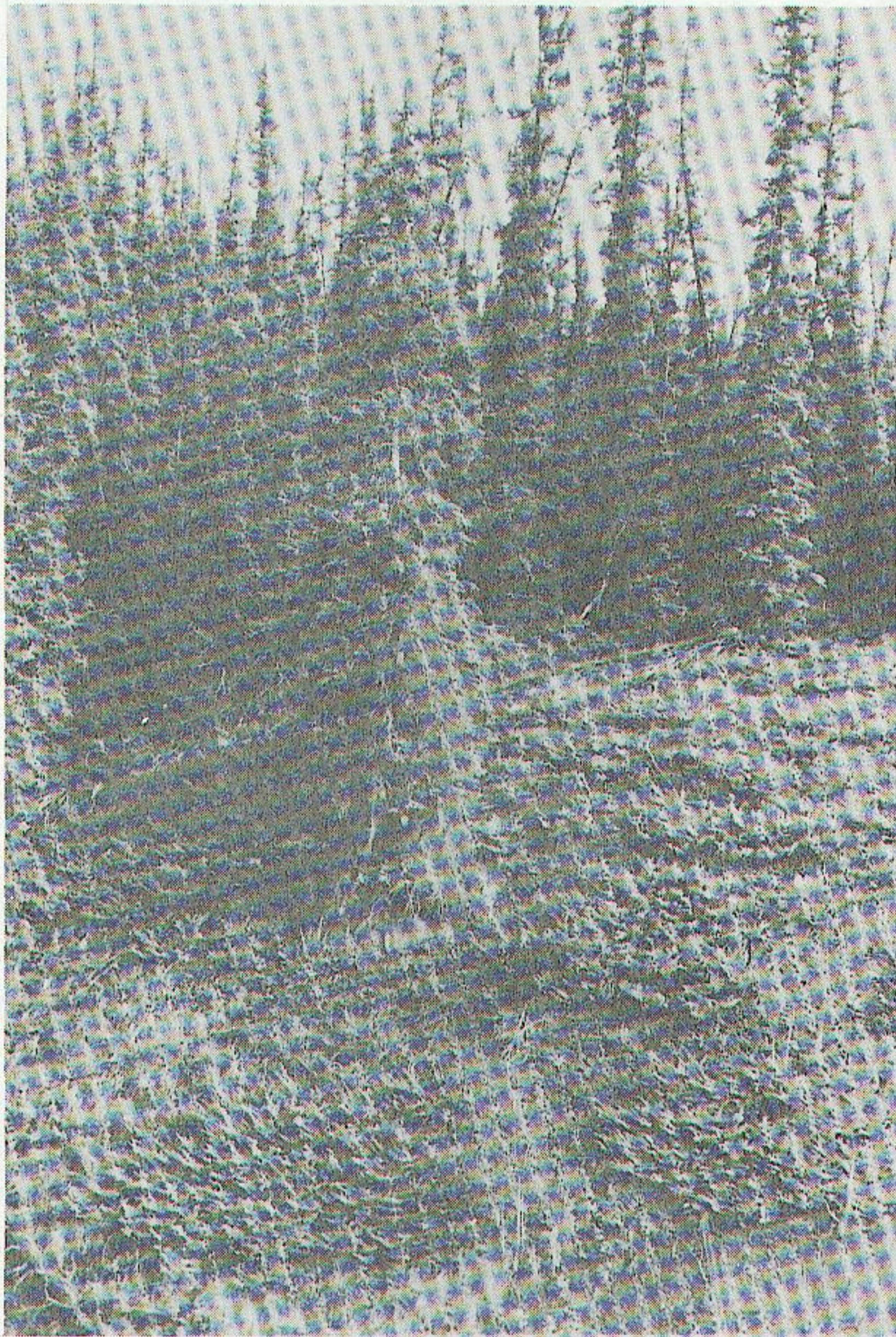




PHOTOGRAPH 3 - DEN SITE NUMBER 27



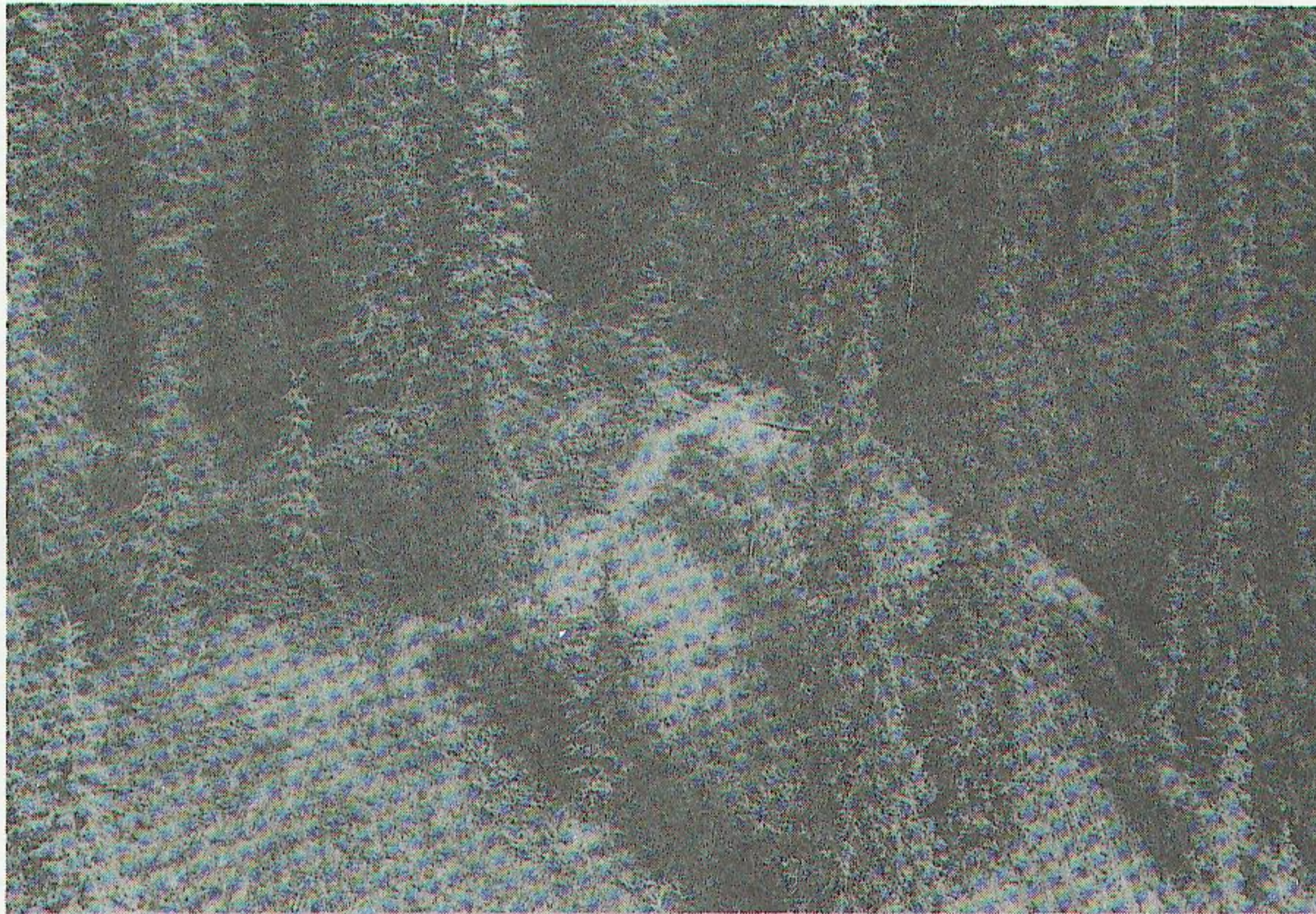
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PHOTOGRAPH OF DEN SITE NUMBER 28



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PHOTOGRAPH 1 - DEN SITE NUMBER 29



PHOTOGRAPH 2 - DEN SITE NUMBER 29



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