

CONTENTS

APPENDICES

1	Plant species list.....	84
2	Post-treatment maps of individual treatment units showing openings.....	88
3	Ecological descriptions of Date Creek site units.....	104
4	Maps of treatment units showing site series distribution.....	112

REFERENCES	128
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Scientific Name	Common Name
Trees	
<i>Abies amabilis</i>	amabilis fir
<i>Abies lasiocarpa</i>	subalpine fir
<i>Betula papyrifera</i>	paper birch
<i>Picea glauca x sitchensis x engelmannii</i>	hybrid white spruce
<i>Picea mariana</i>	black spruce
<i>Pinus contorta</i>	lodgepole pine
<i>Populus tremuloides</i>	trembling aspen
<i>Populus balsamifera ssp. trichocarpa</i>	black cottonwood
<i>Thuja plicata</i>	western redcedar
<i>Tsuga heterophylla</i>	western hemlock
Shrubs	
<i>Acer glabrum</i>	Douglas maple
<i>Alnus incana ssp. tenuifolia</i>	mountain alder
<i>Alnus viridis ssp. sinuata</i>	Sitka alder
<i>Amelanchier alnifolia</i>	saskatoon berry
<i>Betula glandulosa</i>	scrub birch
<i>Cornus sericea</i>	red-osier dogwood
<i>Corylus cornuta</i>	beaked hazelnut
<i>Ledum groenlandicum</i>	Labrador tea
<i>Lonicera involucrata</i>	black twinberry
<i>Menziesia ferruginea</i>	false azalea
<i>Oplopanax horridus</i>	devil's club
<i>Ribes lacustre</i>	black gooseberry
<i>Ribes laxiflorum</i>	trailing black currant
<i>Rosa acicularis</i>	prickly rose
<i>Rubus idaeus</i>	red raspberry
<i>Rubus parviflorus</i>	thimbleberry
<i>Salix spp.</i>	willow
<i>Sambucus racemosa</i>	red elderberry
<i>Sorbus scopulina</i>	western mountain ash
<i>Spiraea betulifolia</i>	birch-leaved spirea
<i>Spiraea douglasii</i>	hardhack
<i>Vaccinium alaskaense</i>	Alaskan blueberry
<i>Vaccinium membranaceum</i>	black huckleberry
<i>Vaccinium ovalifolium</i>	oval-leaved blueberry
<i>Viburnum edule</i>	highbush-cranberry
Herbs and Dwarf Shrubs	
<i>Actaea rubra</i>	baneberry
<i>Andromeda polifolia</i>	bog-rosemary
<i>Angelica genuflexa</i>	kneeling angelica
<i>Aquilegia formosa</i>	red columbine
<i>Aralia nudicaulis</i>	wild sarsaparilla
<i>Arenaria sp.</i>	sandwort

<i>Arnica cordifolia</i>	heart-leaved arnica
<i>Aster borealis</i>	rush aster
<i>Aster ciliolatus</i>	fringed aster
<i>Athyrium filix-femina</i>	lady fern
<i>Botrychium virginianum</i>	rattlesnake fern
<i>Bromus</i> sp.	brome
<i>Calamagrostis canadensis</i>	bluejoint
<i>Cardamine</i> sp.	bitter-cress
<i>Carex diandra</i>	lesser panicled sedge
<i>Carex disperma</i>	soft-leaved sedge
<i>Carex interior</i>	inland sedge
<i>Carex leptalea</i>	bristle-stalked sedge
<i>Carex limosa</i>	shore sedge
<i>Carex pauciflora</i>	few-flowered sedge
<i>Carex rostrata</i>	beaked sedge
<i>Carex sitchensis</i>	Sitka sedge
<i>Carex vesicaria</i>	inflated sedge
<i>Chimaphila umbellata</i>	prince's pine
<i>Cinna latifolia</i>	nodding wood-reed
<i>Circaea alpina</i>	enchanter's nightshade
<i>Clintonia uniflora</i>	queen's cup
<i>Corallorhiza maculata</i>	spotted coralroot
<i>Cornus canadensis</i>	bunchberry
<i>Drosera anglica</i>	long-leaved sundew
<i>Drosera rotundifolia</i>	round-leaved sundew
<i>Dryopteris assimilis</i>	spiny wood fern
<i>Elymus glaucus</i>	blue wildrye
<i>Epilobium angustifolium</i>	fireweed
<i>Epilobium palustre</i>	swamp willowherb
<i>Equisetum arvense</i>	common horsetail
<i>Equisetum hyemale</i>	scouring-rush
<i>Equisetum sylvaticum</i>	wood horsetail
<i>Eriophorum angustifolium</i>	narrow-leaved cotton-grass
<i>Galium boreale</i>	northern bedstraw
<i>Galium trifidum</i>	small bedstraw
<i>Galium triflorum</i>	sweet-scented bedstraw
<i>Gaultheria hispidula</i>	creeping-snowberry
<i>Geocaulon lividum</i>	bastard toad-flax
<i>Geranium erianthum</i>	northern geranium
<i>Geum macrophyllum</i>	large-leaved avens
<i>Glyceria</i> sp.	mannagrass
<i>Goodyera oblongifolia</i>	rattlesnake-plantain
<i>Goodyera repens</i>	dwarf rattlesnake orchid
<i>Gymnocarpium dryopteris</i>	oak fern
<i>Hierochloa odorata</i>	common sweetgrass
<i>Hypopitys monotropa</i>	pinemap
<i>Impatiens noli-tangere</i>	common touch-me-not
<i>Kalmia microphylla</i>	bog-laurel

<i>Lathyrus nevadensis</i>	purple peavine
<i>Linnaea borealis</i>	twinflower
<i>Listera cordata</i>	heart-leaved twayblade
<i>Lycopodium annotinum</i>	stiff clubmoss
<i>Lycopodium complanatum</i>	ground-cedar
<i>Lycopodium obscurum</i>	ground-pine
<i>Lysichiton americanum</i>	skunk cabbage
<i>Mentha arvensis</i>	field mint
<i>Menyanthes trifoliata</i>	buckbean
<i>Mitella nuda</i>	common mitrewort
<i>Moneses uniflora</i>	single delight
<i>Orthilia secunda</i>	one-sided wintergreen
<i>Oryzopsis asperifolia</i>	rough-leaved ricegrass
<i>Osmorhiza chilensis</i>	mountain sweet-cicely
<i>Parnassia fimbriata</i>	fringed grass-of-Parnassus
<i>Petasites palmatus</i>	palmate coltsfoot
<i>Petasites sagittatus</i>	arrow-leaved coltsfoot
<i>Platanthera dilatata</i>	white bog-orchid
<i>Platanthera hyperborea</i>	green-flowered bog-orchid
<i>Platanthera orbiculata</i>	round-leaved rein-orchid
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Potentilla palustris</i>	marsh cinquefoil
<i>Prenanthes alata</i>	western rattlesnake-root
<i>Pterospora andromeda</i>	pinetops
<i>Pyrola asarifolia</i>	pink wintergreen
<i>Pyrola chlorantha</i>	green wintergreen
<i>Rubus arcticus</i>	dwarf nagoonberry
<i>Rubus chamaemorus</i>	cloudberry
<i>Rubus pedatus</i>	five-leaved bramble
<i>Rubus pubescens</i>	trailing raspberry
<i>Saxifraga nelsoniana</i>	brook saxifrage
<i>Scirpus microcarpus</i>	small-flowered bulrush
<i>Senecio triangularis</i>	arrow-leaved groundsel
<i>Smilacina racemosa</i>	false Solomon's-seal
<i>Smilacina stellata</i>	star-flowered false Solomon's seal
<i>Spiranthes romanzoffiana</i>	ladies' tresses
<i>Stellaria</i> sp.	starwort
<i>Streptopus amplexifolius</i>	clasping twistedstalk
<i>Streptopus roseus</i>	rosy twistedstalk
<i>Streptopus streptopoides</i>	small twistedstalk
<i>Thalictrum occidentale</i>	western meadowrue
<i>Thelypteris phegopteris</i>	beech fern
<i>Tiarella laciniata</i>	cut-leaved foamflower
<i>Tiarella trifoliata</i>	three-leaved foamflower
<i>Tiarella unifoliata</i>	one-leaved foamflower
<i>Tofieldia glutinosa</i>	sticky false asphodel
<i>Trichophorum cespitosum</i>	tufted clubrush
<i>Trientalis europaea</i>	northern starflower

APPENDIX 1 *Concluded.*

<i>Triglochin maritimum</i>	seaside arrow-grass
<i>Urtica dioica</i>	stinging nettle
<i>Vaccinium oxycoccos</i>	bog cranberry
<i>Vaccinium vitis-idaea</i>	lingonberry
<i>Veronica</i> sp.	speedwell
<i>Viola canadensis</i>	Canada violet
<i>Viola glabella</i>	stream violet
<i>Viola palustris</i>	marsh violet
<i>Viola</i> spp.	violet

Mosses, Lichens, and Liverworts

Aulacomnium palustre
Barbilophozia sp.
Brachythecium spp.
Calliergon sp.
Cladina mitis
Cladina rangiferina
Conocephalum conicum
Dicranum scoparium
Dicranum spp.
Hylocomium splendens
Mnium spp.
Peltigera aphthosa
Plagiochila asplenioides
Plagiomnium insigne
Pleurozium schreberi
Ptilium crista-castrensis
Rhytidiadelphus loreus
Rhytidiadelphus triquetrus
Sphagnum spp.
Tomenthypnum nitens

The following 16 maps present the post-treatment distribution of openings for each treatment unit. Aerial photographs were taken of each treatment unit and digitized using GIS (scale = 1:4000).

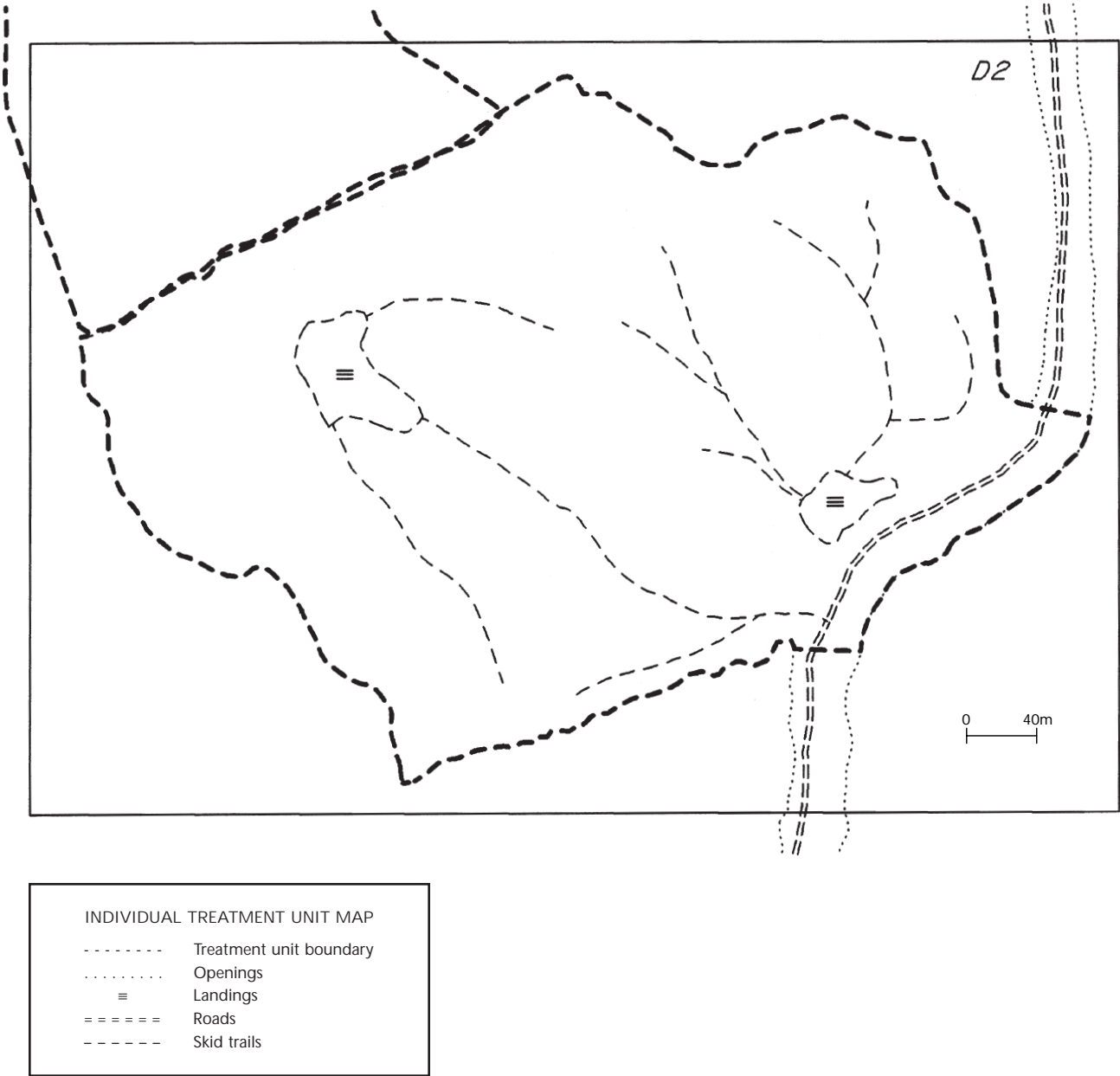


FIGURE A2.1 Map of treatment unit D2 (clearcut).

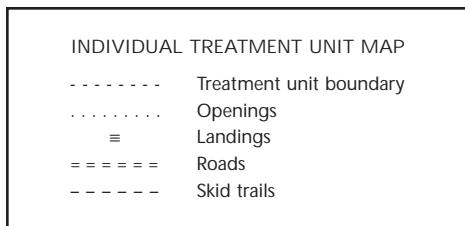
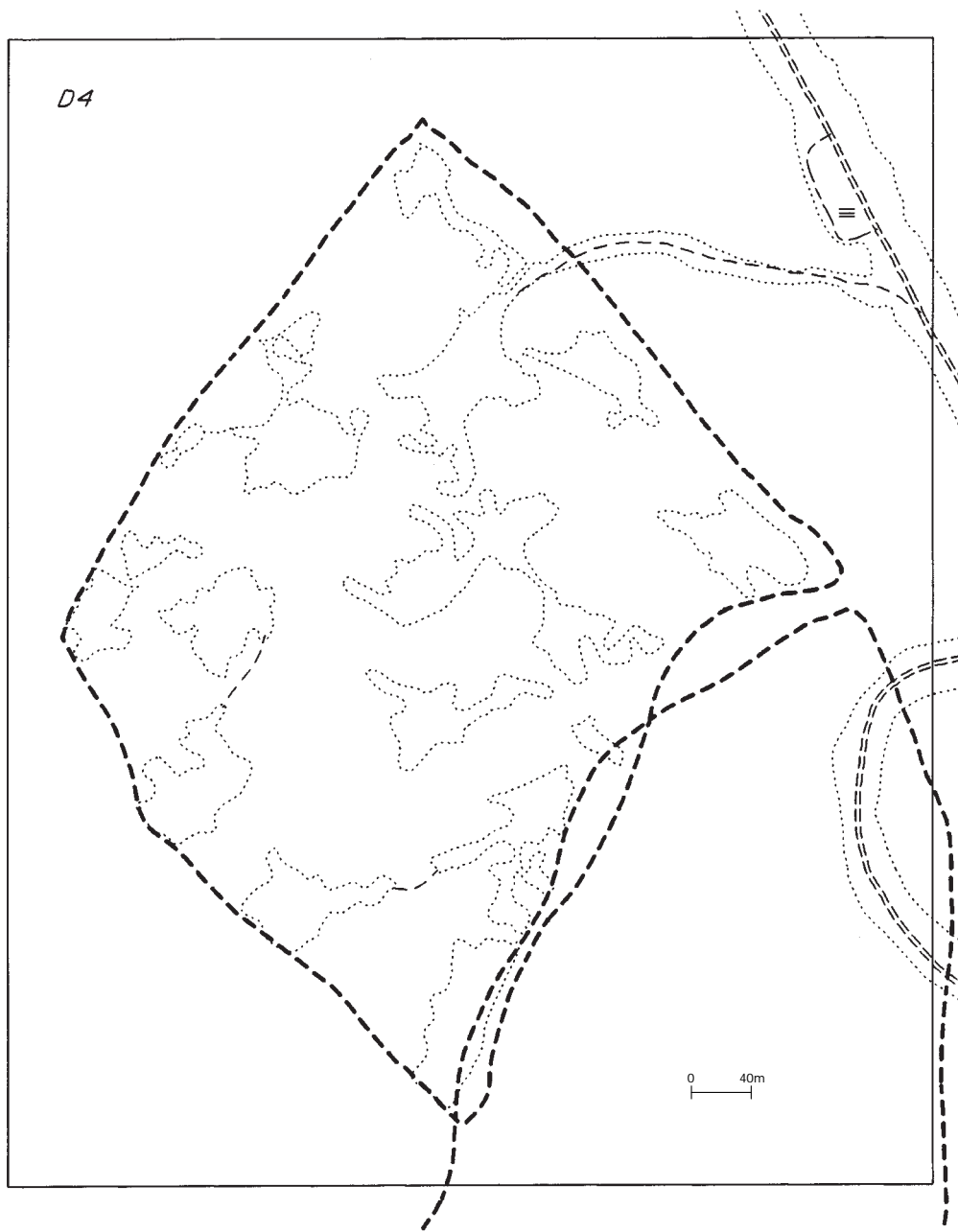


FIGURE A2.2 *Map of treatment unit D4 (heavy removal) with opening distribution.*

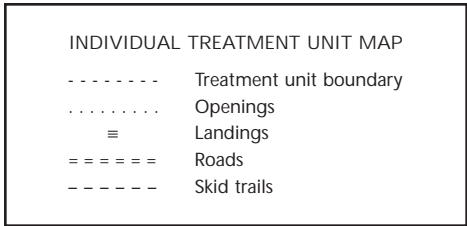
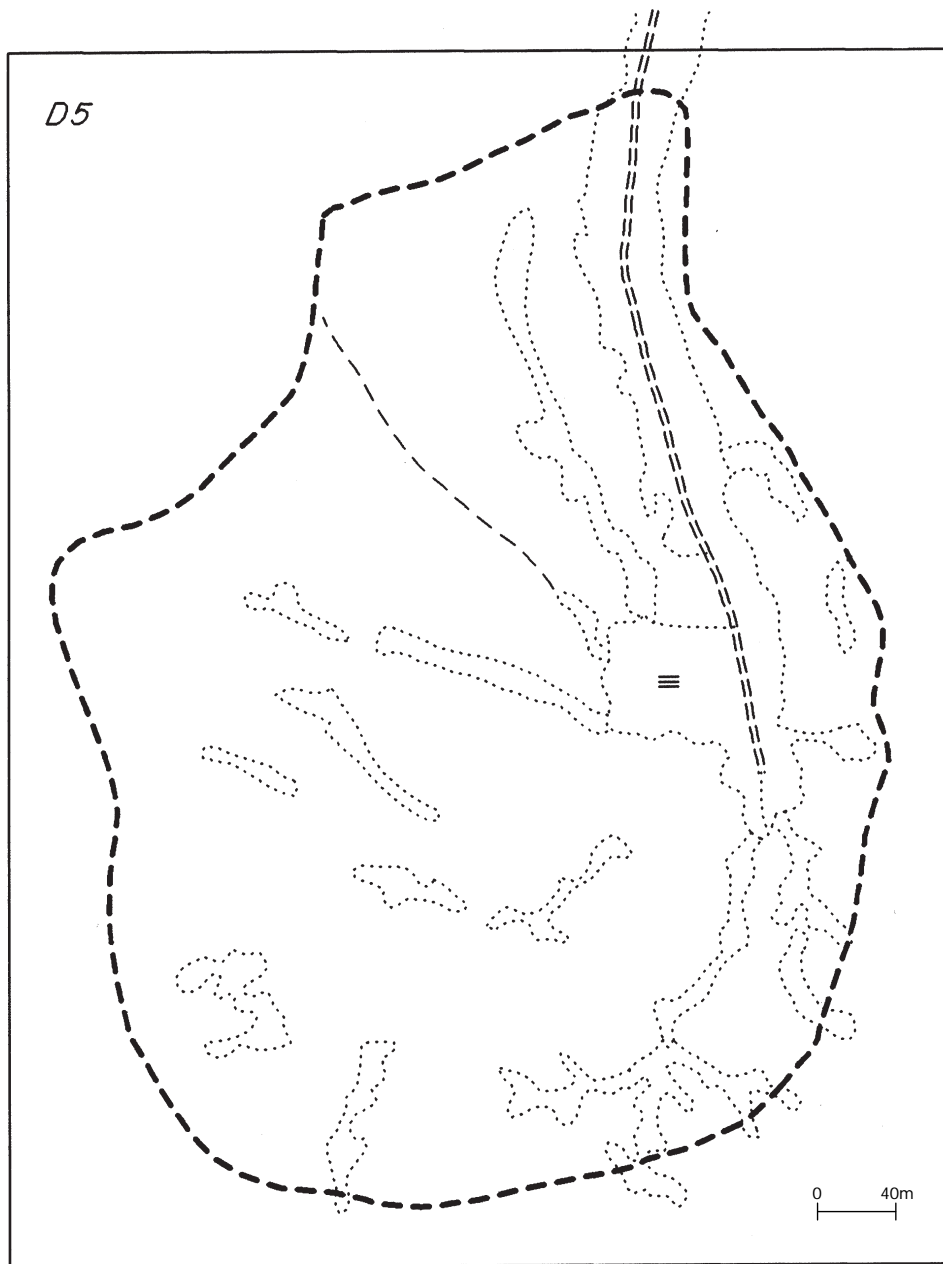


FIGURE A2.3 *Map of treatment unit D5 (light removal) with opening distribution.*

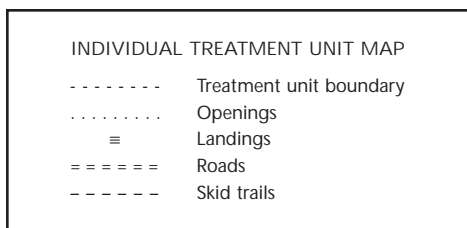
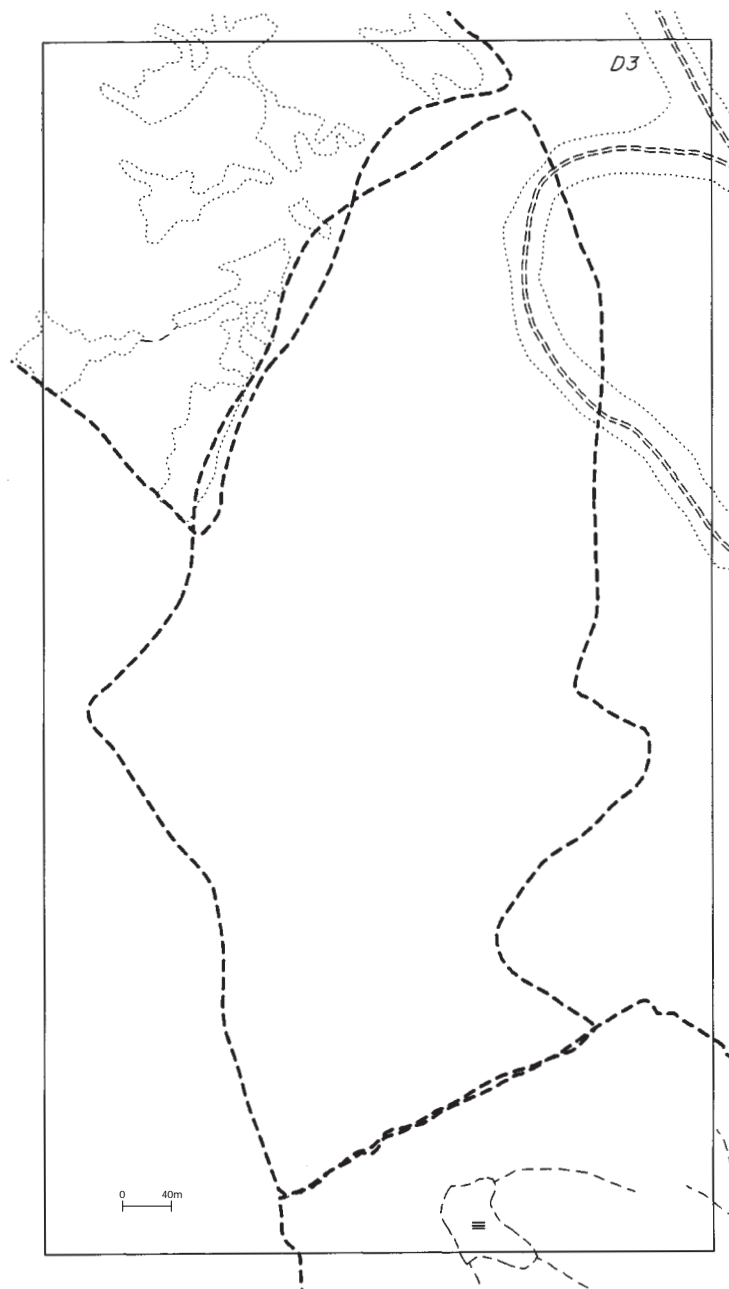


FIGURE A2.4 *Map of treatment unit D3 (no harvest).*

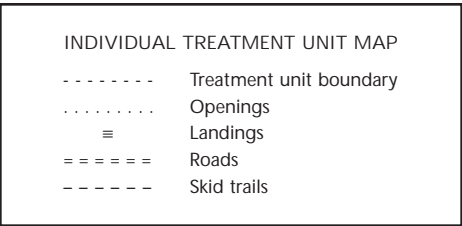
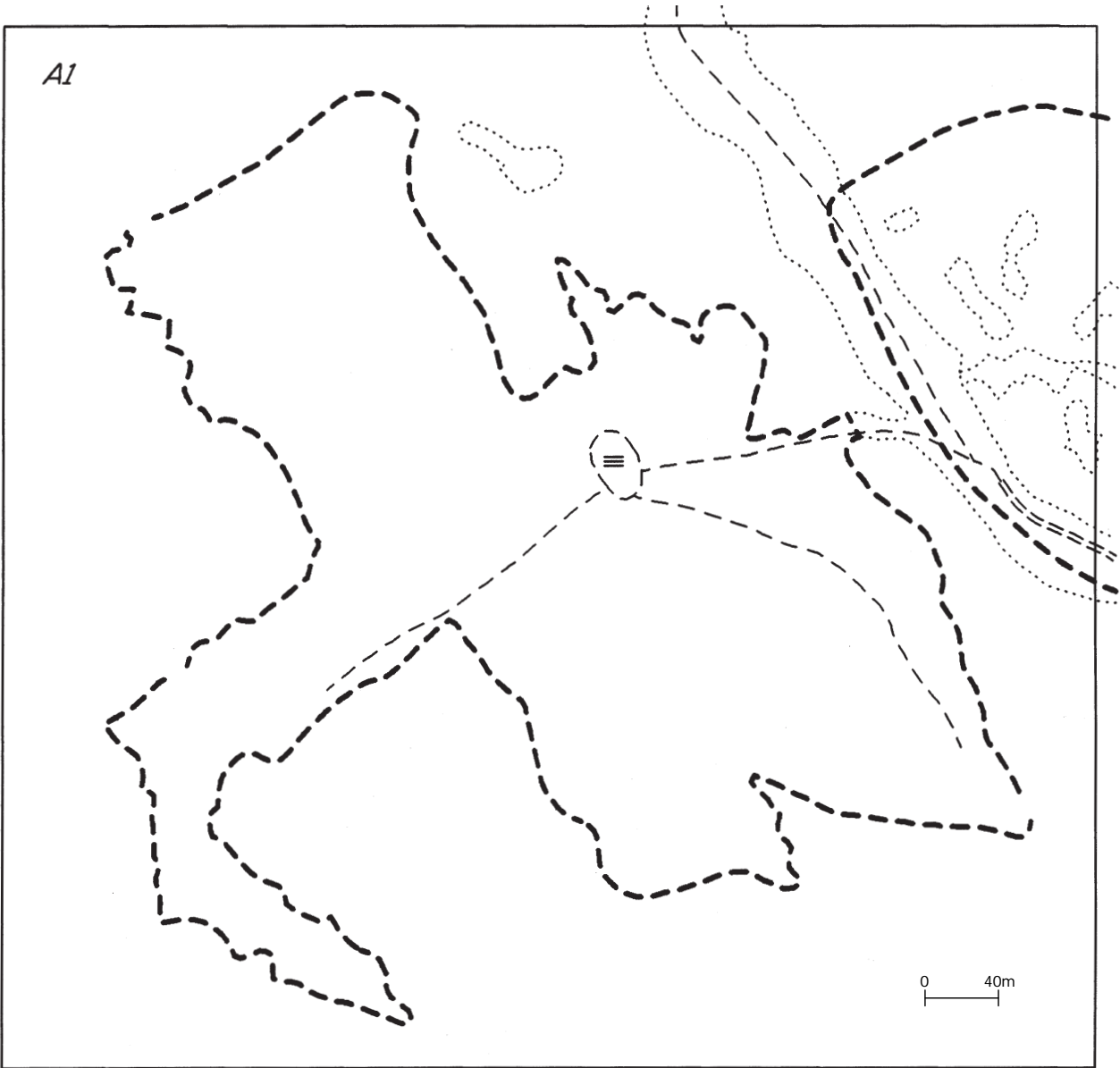


FIGURE A2.5 *Map of treatment unit A1 (clearcut).*

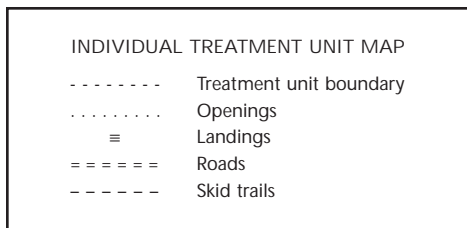
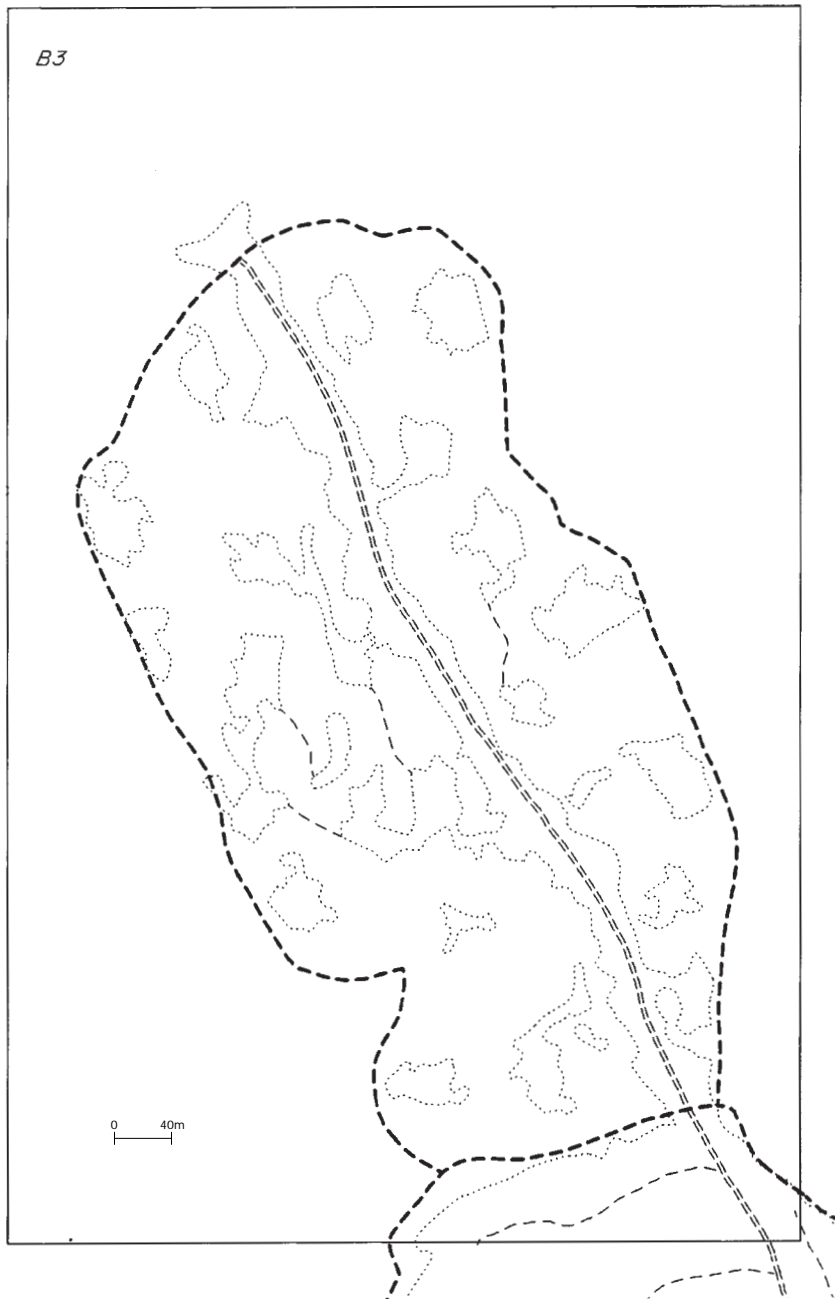


FIGURE A2.6 *Map of treatment unit B3 (heavy removal) with opening distribution.*

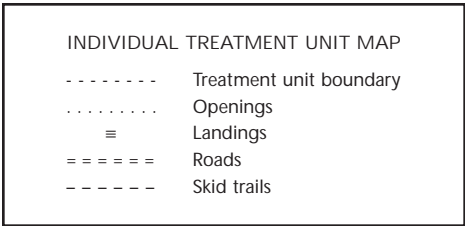
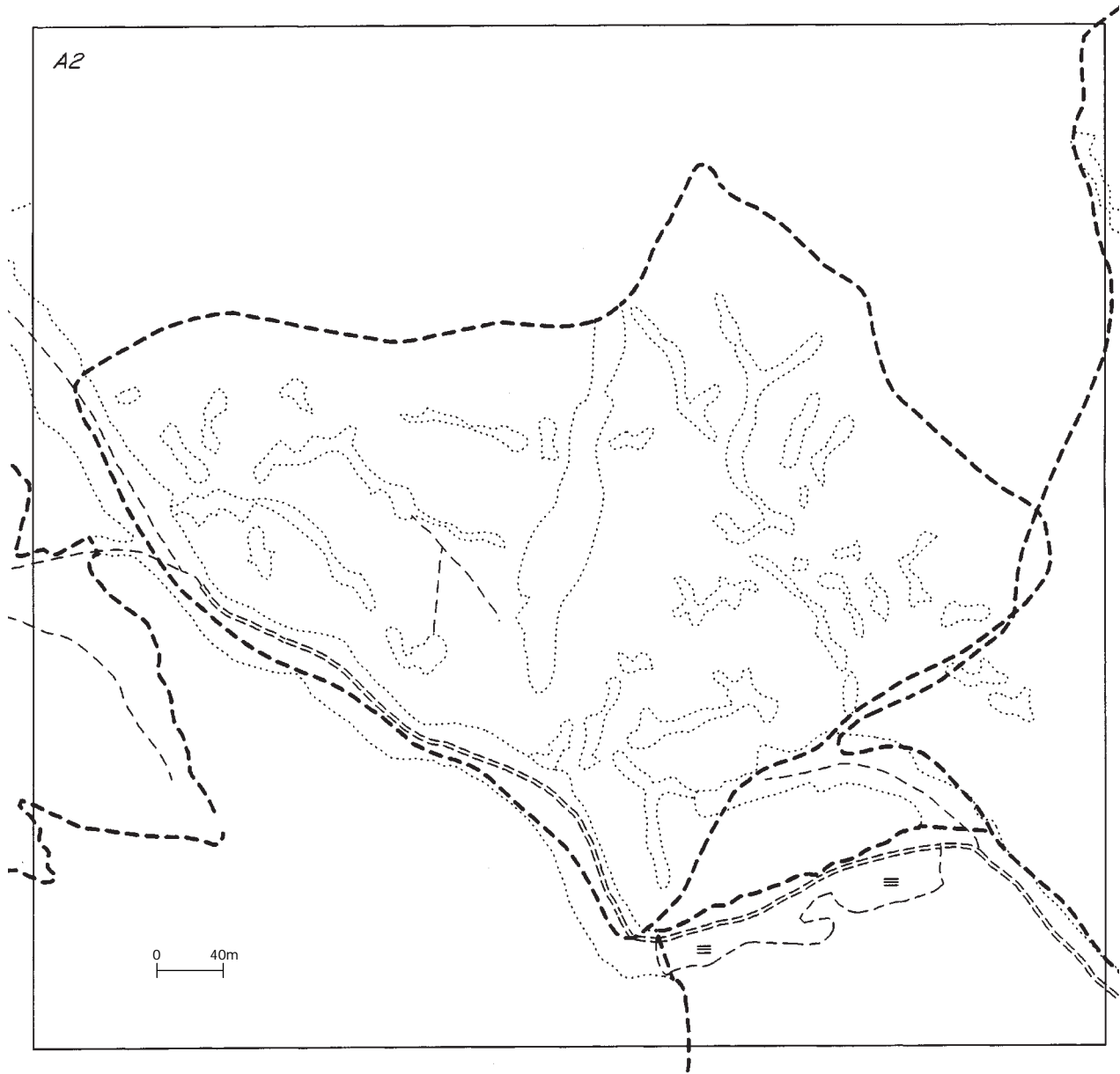


FIGURE A2.7 *Map of treatment unit A2 (light removal) with opening distribution.*

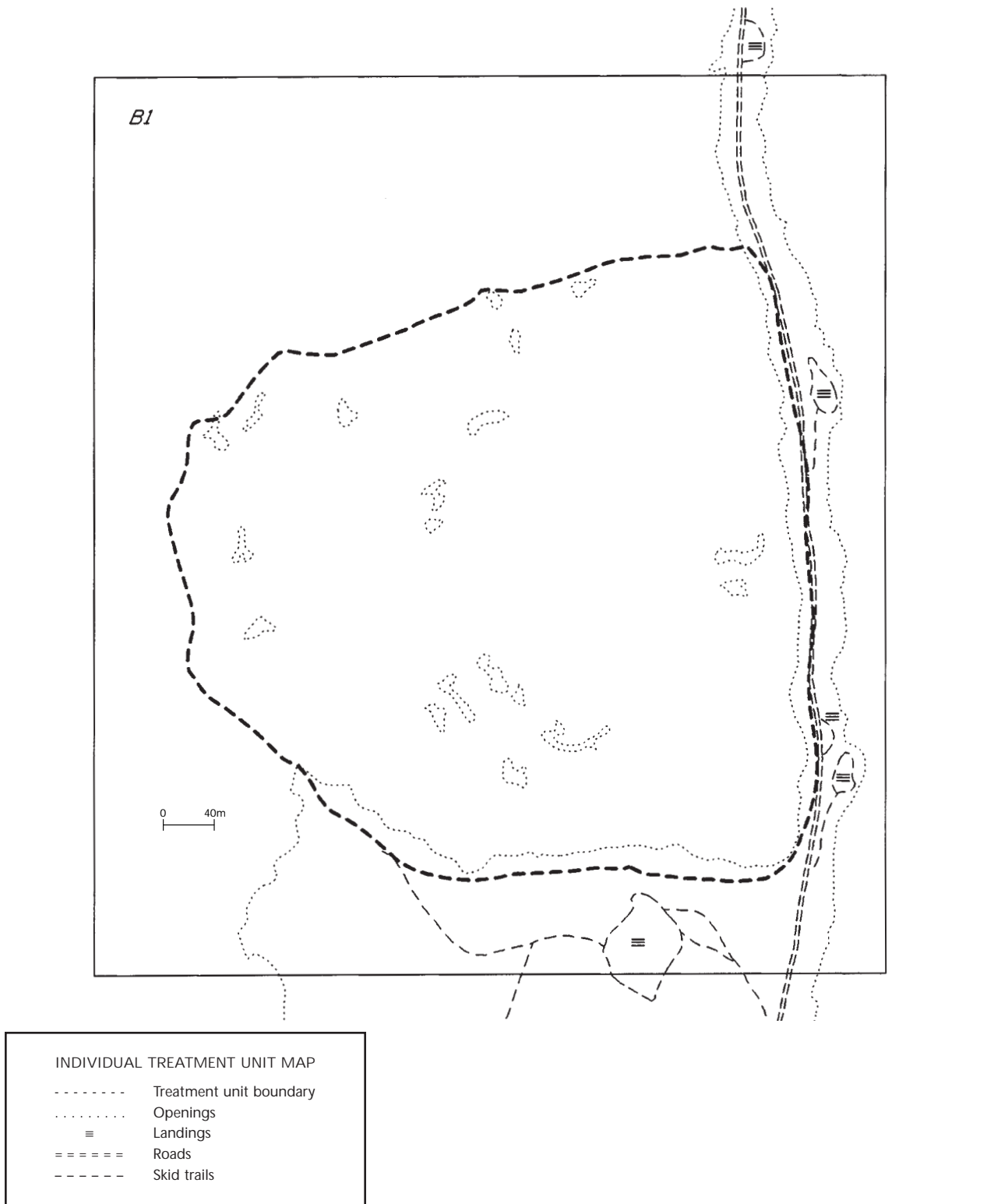


FIGURE A2.8 *Map of treatment unit B1 (no harvest).*

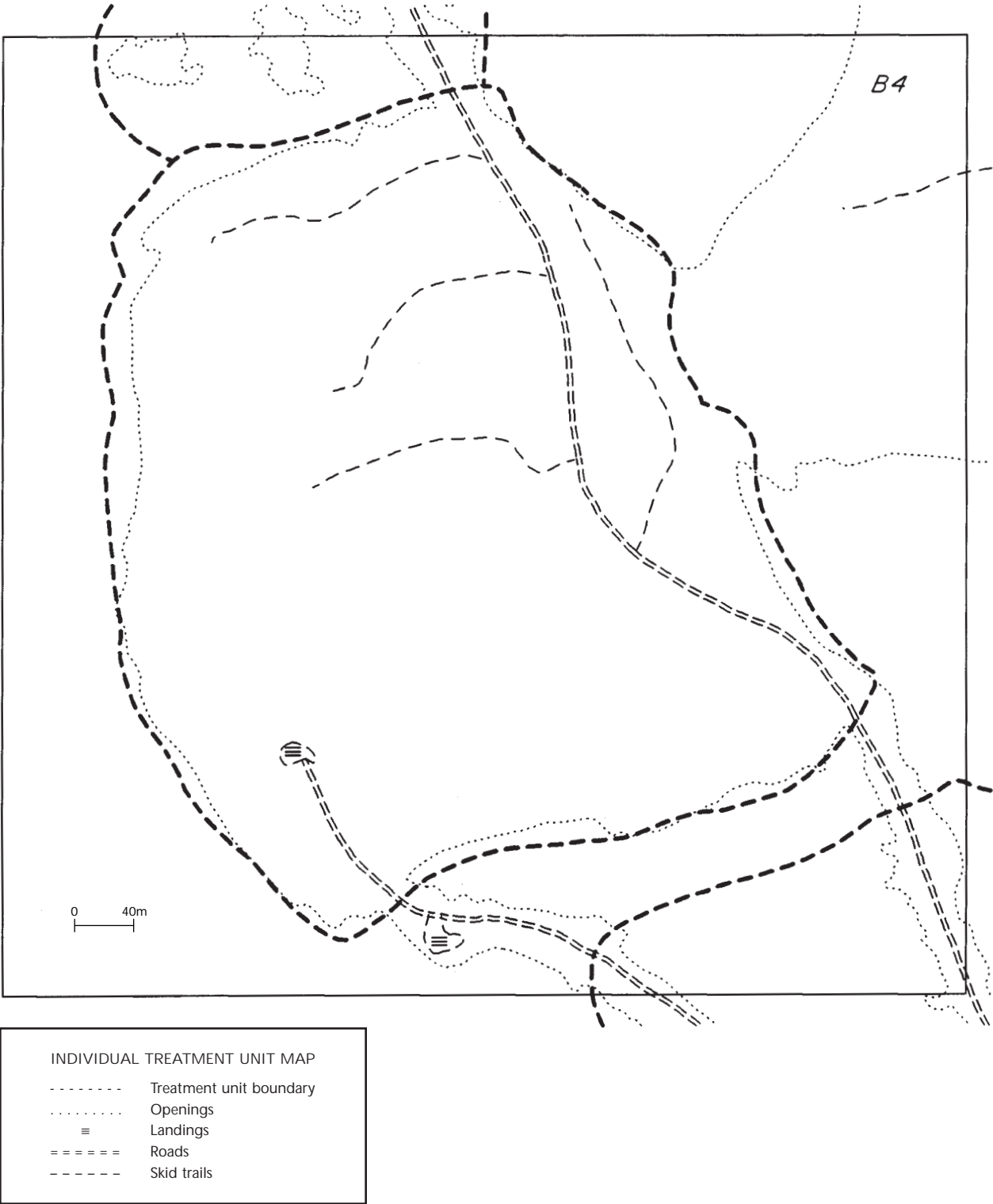


FIGURE A2.9 *Map of treatment unit B4 (clearcut).*

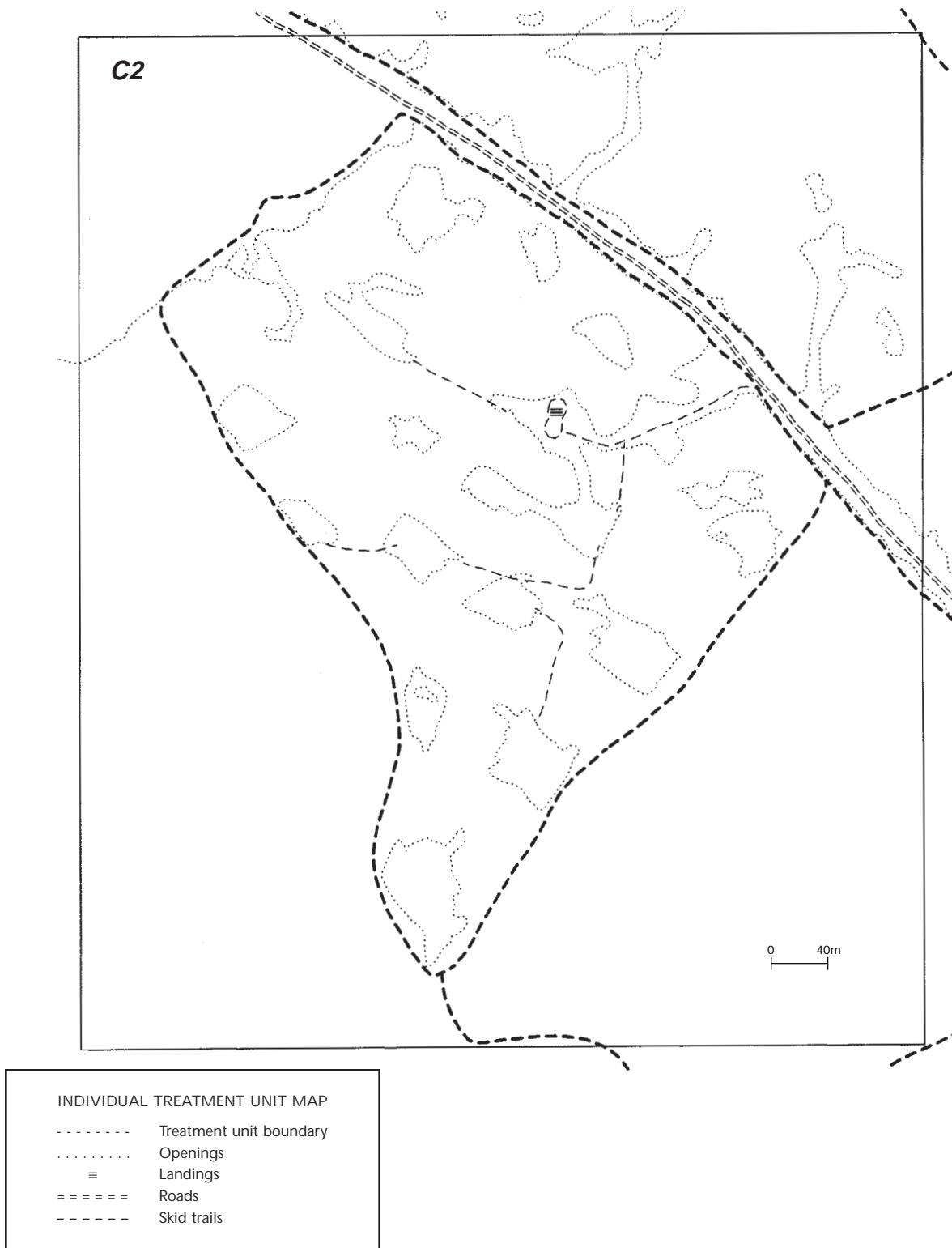


FIGURE A2.10 *Map of treatment unit C2 (heavy removal) with opening distribution.*

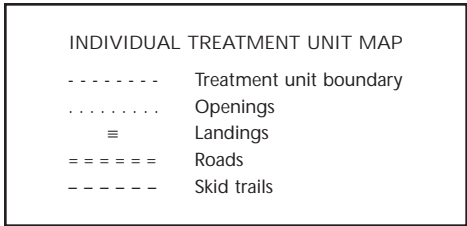
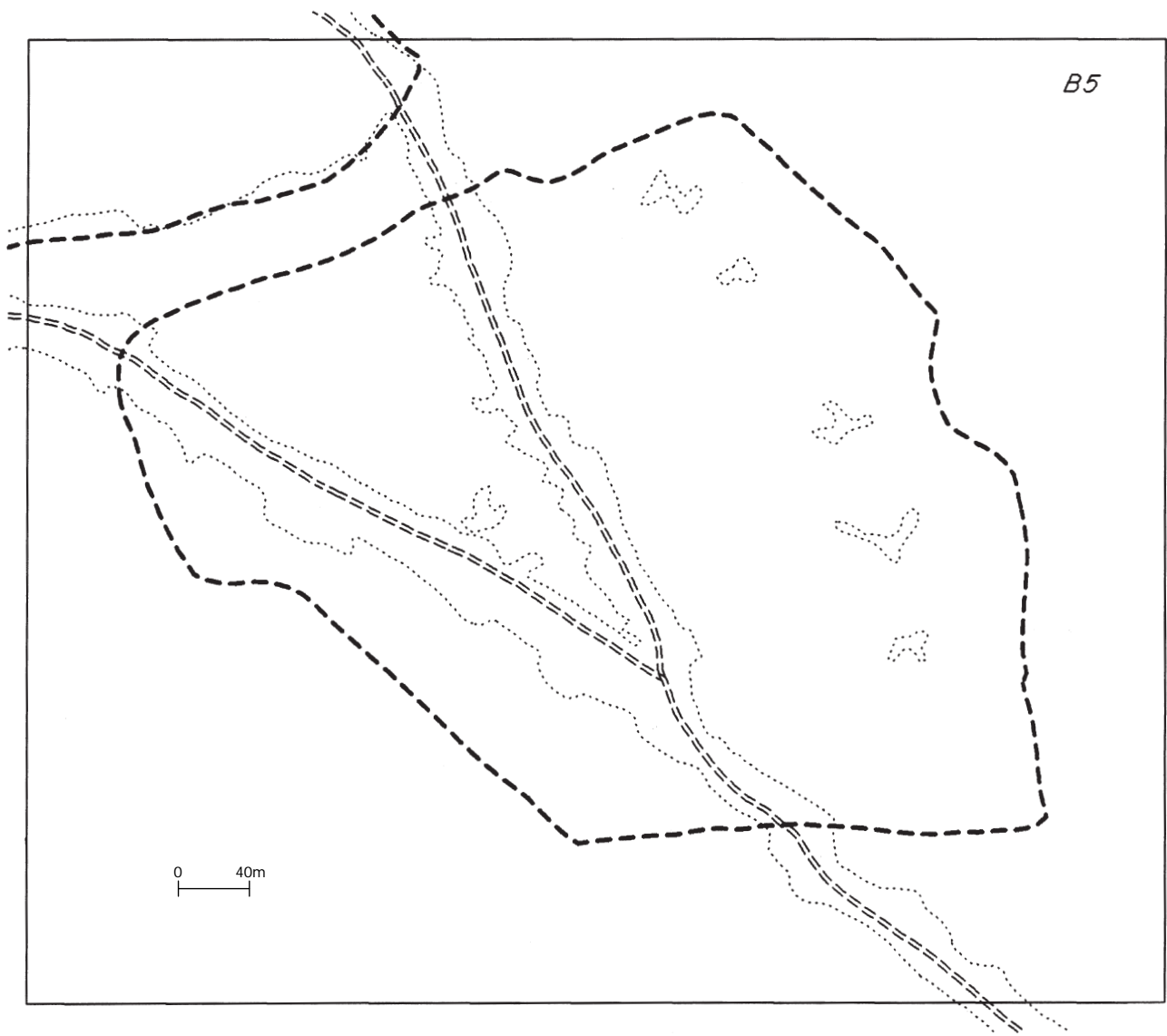


FIGURE A2.11 *Map of treatment unit B5 (light removal) with opening distribution.*

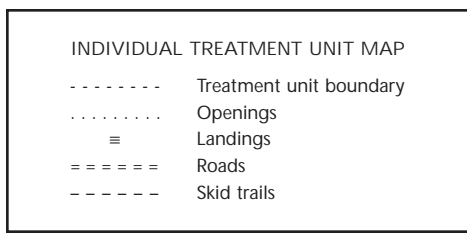


FIGURE A2.12 *Map of treatment unit C1 (no harvest).*

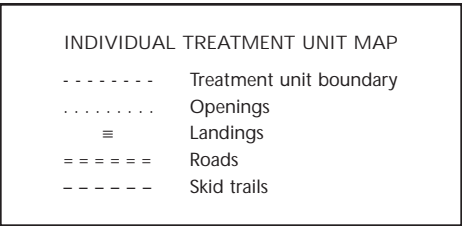
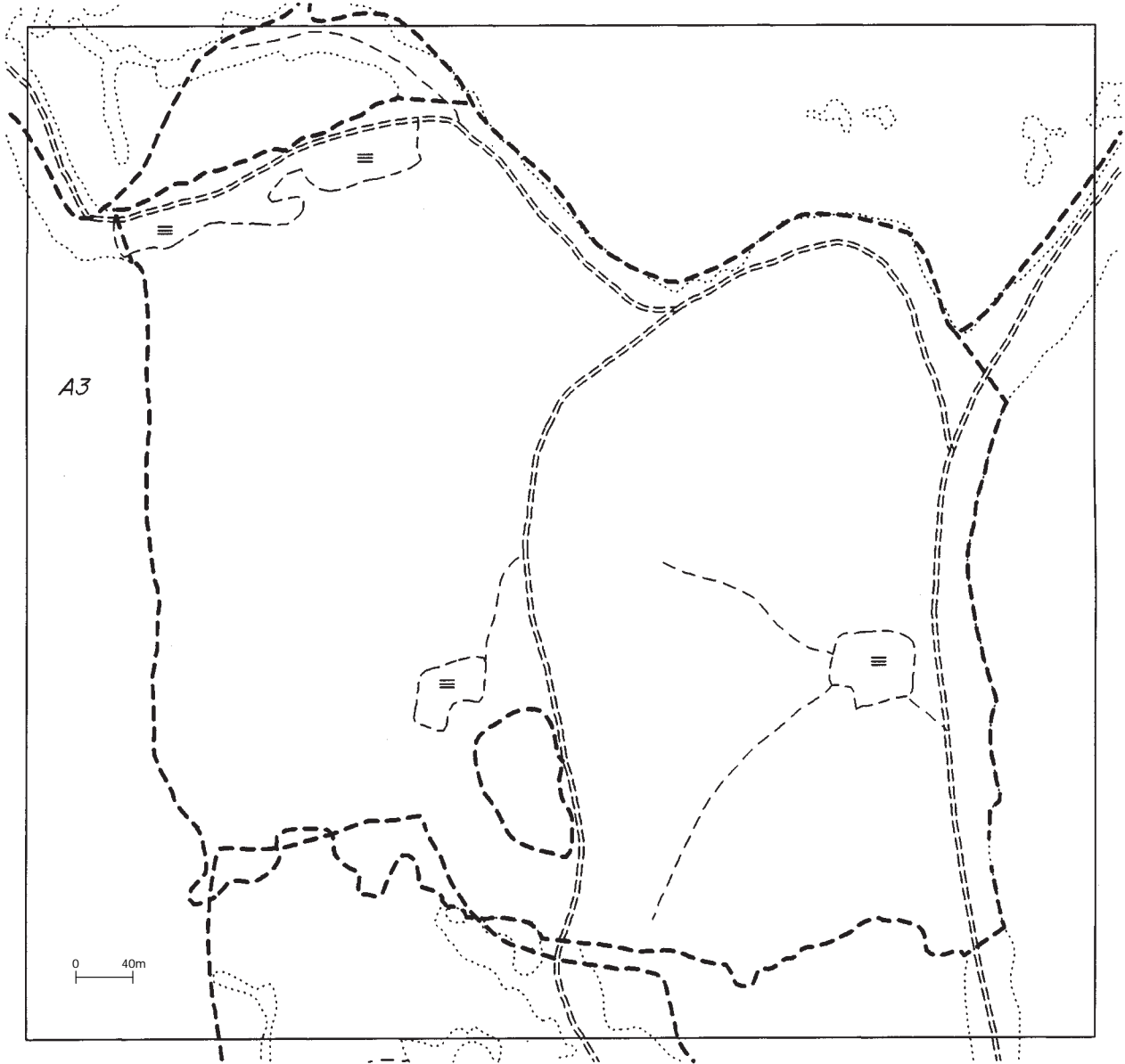


FIGURE A2.13 *Map of treatment unit A3 (clearcut).*

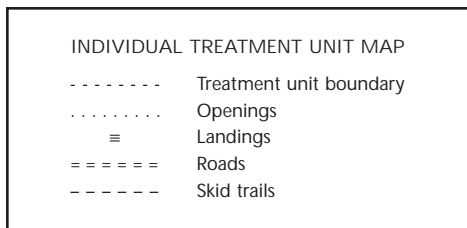
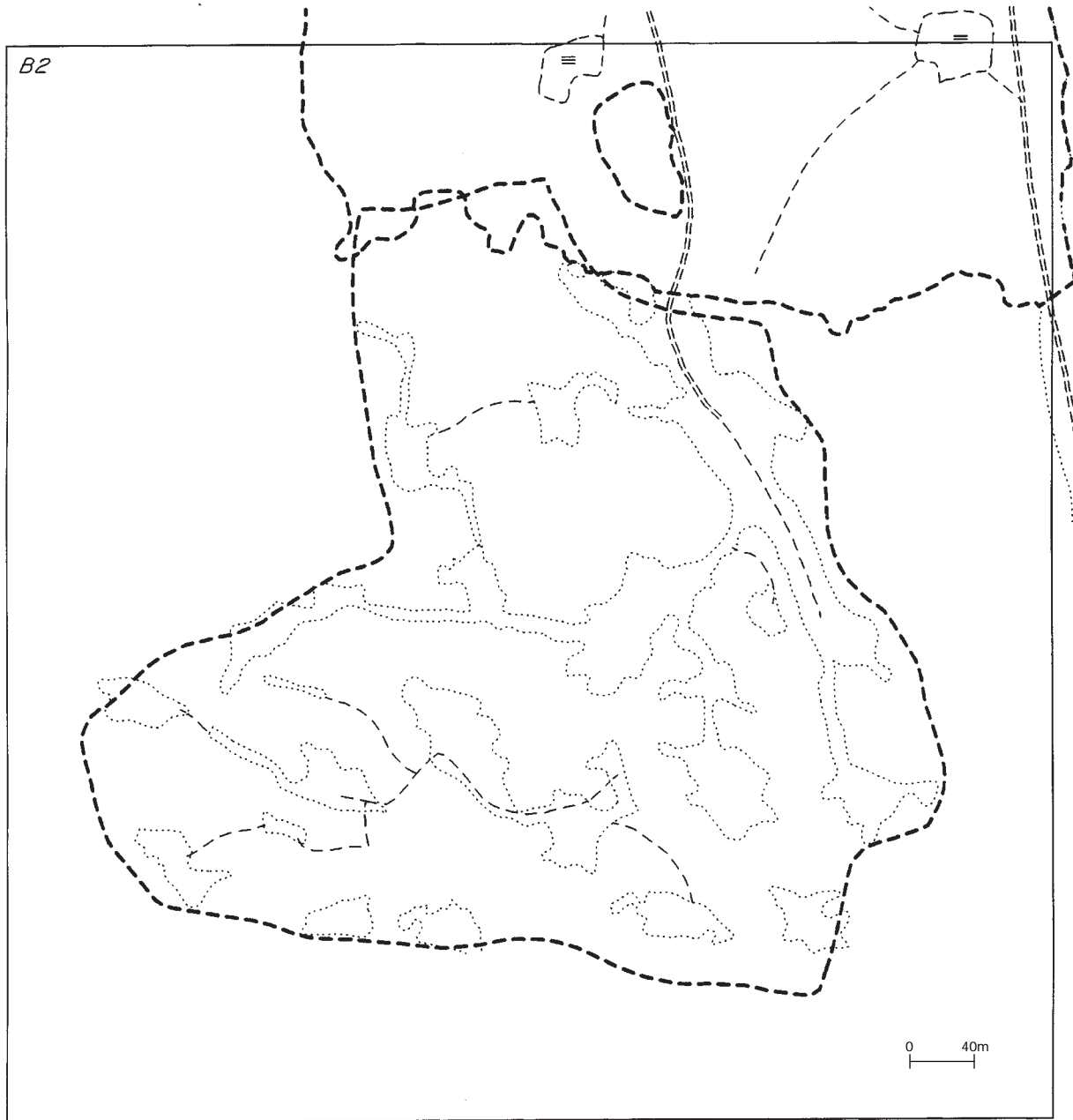


FIGURE A2.14 *Map of treatment unit B2 (heavy removal) with opening distribution.*

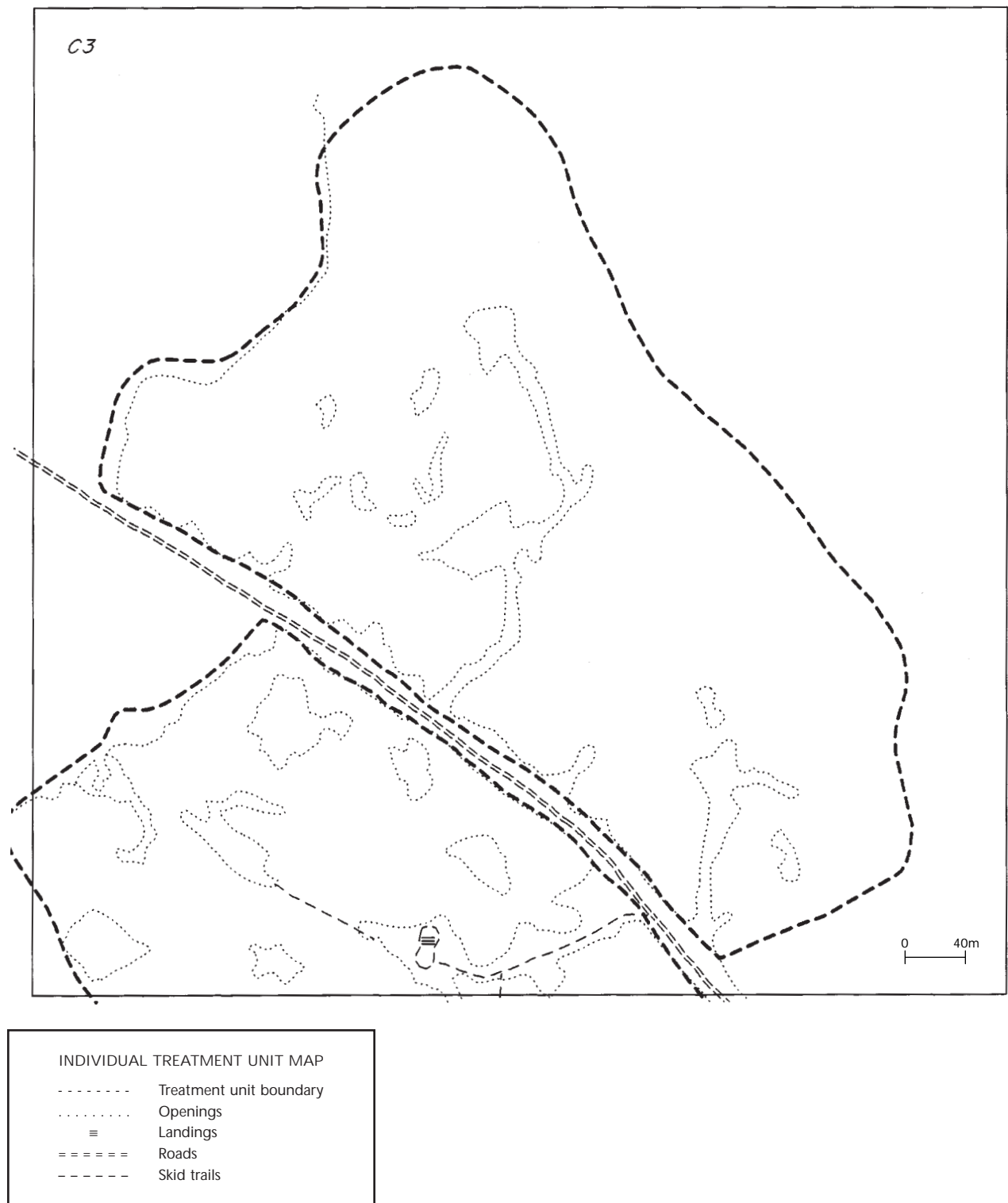


FIGURE A2.15 *Map of treatment unit C3 (light removal) with opening distribution.*

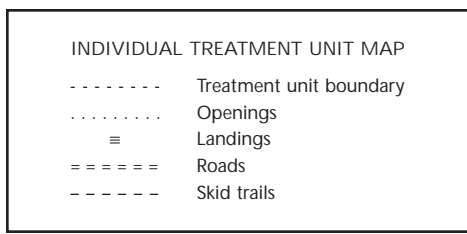
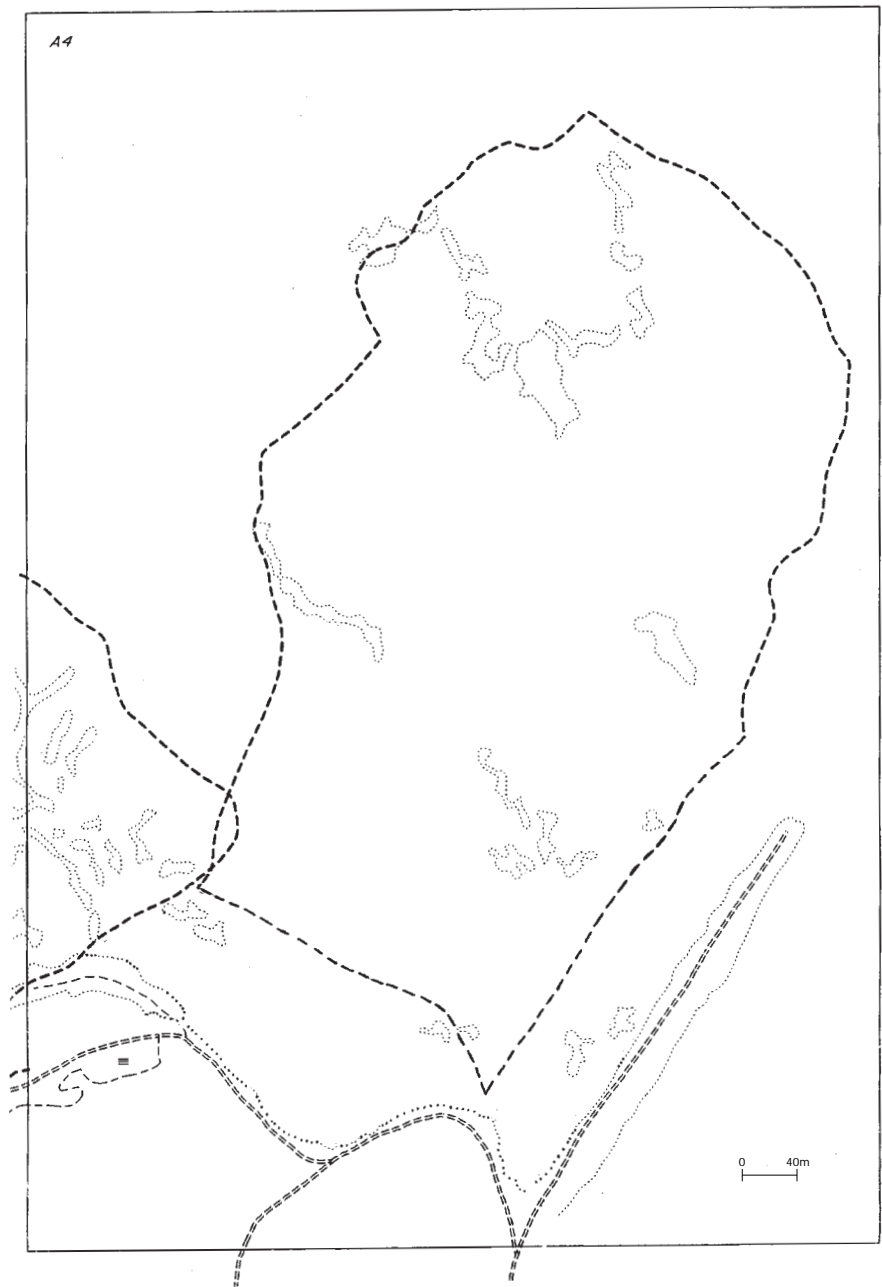


FIGURE A2.16 *Map of treatment unit A4 (no harvest).*

For the purpose of ecosystem mapping of the Date Creek research area, the site series were grouped into “site units.” Table A1 (below) lists the site units with their respective ICHmc2 site series.

TABLE A3.1 Summary of site units with corresponding site series

Map symbol	Site unit name	Site series ^a (ICHmc2)
HM	Hemlock–Moss	01(a)
HM(1) ^b	Hemlock–Moss; mixed wood seral association	52
SM	Submesic Moss	01(b); 51
OF	Oak fern	03
DC	Devil’s club	04, 05, 54
CF	Cottonwood Floodplain	06
SL	Skunk cabbage–Lady fern	07
HW	Herb Wetland	31, 32
SW	Shrub Wetland	31, 32
FW	Forested Wetland	08

^a Site series as described in Banner et al. (1993). Site series 02 (HwPl–kinnikinnick–Cladonia) and 53 (SAEp–dogwood) are uncommon in the study area. There were no sites sampled within the Cottonwood Floodplain ecosystem (site series 06).

^b HM(1) refers to a seral association of the Hemlock–moss site unit.

For each site unit a summary of the vegetation and environment/soils data is presented. These summaries are derived from the 156 reconnaissance plots done throughout the study area. Dominant plant species are not in parentheses (occur with 75% or greater frequency, and a mean cover of 5% or greater), while those in parentheses occur infrequently or often with varying cover values. Species are listed in decreasing importance and Latin names are in brackets.

Some ecosystem units are divided into successional stages (refer to Table 6 of main report) and are indicated as such (e.g., HM6 refers to the mature forest successional stage). Tree layer data were recorded for three subdivisions: A1—dominant trees, A2—main canopy, A3—secondary canopy or suppressed trees. The mean cover for the entire tree layer is provided.

Within the environment and soils section of the reconnaissance plot summary, the characteristic parameters (soil development, etc.) are listed in decreasing order of dominance. Some parameters are listed as a range of conditions (e.g., soil texture).

Note that we have not provided separate site unit descriptions for the ICHmc1a portion of the research area. HM, OF, and DC site units occurring in the ICHmc1a are similar to those of the ICHmc2 except that western redcedar is lacking and amabilis fir is more abundant, both in the tree layer and as regeneration.

ICHmc2 HM4–5 Hemlock–Moss site unit, pole-sapling and young forest (11 plots)

Vegetation

Trees: continuous cover with very low diversity (mean cover 80%).

A1 (western hemlock [*Tsuga heterophylla*])

A2 western hemlock (subalpine fir [*Abies lasiocarpa*])

A3 western hemlock (western redcedar [*Thuja plicata*])

Shrubs: virtually non-existent.

(western hemlock)

(false azalea [*Menziesia ferruginea*])

Herbs: very scarce, sometimes lacking.
 (bunchberry [*Cornus canadensis*])
 (five-leaved bramble [*Rubus pedatus*])

Moss layer: usually well developed with high cover value.

Hylocomium splendens
Ptilium crista-castrensis
Pleurozium schreberi

Environment/Soils

Parent material: morainal blanket, morainal veneer
 Soil development: Eluviated Dystric Brunisol,
 Orthic Humo-Ferric Podzol, Orthic Dystric
 Brunisol, Orthic Gray Luvisol
 Humus form: Hemimor, Mormoder
 Humus depth (cm): 5–14
 Coarse fragment (%): 5–75
 Soil texture: loam to sandy clay loam

Moisture regime: mesic
 Nutrient regime: medium

Slope (%): 0–75
 Aspect (o): all

Comments: Pole-sapling stages are typically composed of dense “doghair” western hemlock that have developed with excessive overstocking after forest fires about 100 years ago. Trees are usually less than 15 m high and have small diameters.

ICHmc2 HM6 Hemlock–Moss site unit, mature forest (36 plots)

Vegetation

Trees: continuous unbroken cover (mean cover 74%).

A1 (western hemlock)
 (hybrid white spruce [*Picea glauca* × *sitchensis*
 × *engelmannii*])
 (subalpine fir)
 A2 western hemlock
 (western redcedar)

(paper birch [*Betula papyrifera*])
 (subalpine fir)

A3 western hemlock
 (western redcedar)

Shrubs: very sparse, primarily regenerating conifers.

western hemlock
 (western redcedar)
 (false azalea)

Herbs: very sparse, cover values often less than 3%.

(bunchberry)
 (one-sided wintergreen [*Orthilia secunda*])
 (green wintergreen [*Pyrola chlorantha*])
 (round-leaved rein-orchid [*Platanthera orbiculata*])

Moss layer: continuous and well developed.

Hylocomium splendens
Ptilium crista-castrensis
Pleurozium schreberi
 (*Rhytidiadelphus triquetrus*)

Environment/soils

Parent material: morainal blanket
 Soil development: Eluviated Dystric Brunisol,
 Orthic Dystric Brunisol, Orthic Humo-Ferric
 Podzol, Orthic Gray Luvisol, Brunisolic Gray
 Luvisol
 Humus form: Hemimor, Mormoder
 Humus depth (cm): 4–14
 Coarse fragments (%): 15–80
 Soil texture: loamy sand to clay loam

Moisture regime: mesic (submesic to subhygric)
 Nutrient regime: medium

Slope (%): 0–40
 Aspect (o): all

Comments: Well-developed, productive forests with poorly developed shrub and herb layers. This is the most common site unit and successional stage in the study area.

**ICHmc2 HM7 Hemlock–moss unit, old growth
(12 plots)**

Vegetation

Trees: well developed and homogenous, but sometimes patchy with stand openings (mean cover 60%).

- A1 western hemlock
- A2 western hemlock
(western redcedar
(amabilis fir [*Abies amabilis*]))
- A3 western hemlock

Shrubs: discontinuous and patchy, sometimes well developed in stand openings.

- western hemlock
(oval-leaved blueberry [*Vaccinium ovalifolium*])
(false azalea
(amabilis fir
(western redcedar))

Herbs: patchy and sparse.

- bunchberry
- five-leaved bramble
(oak fern [*Gymnocarpium dryopteris*])
(one-sided wintergreen)
(twinflower [*Linnaea borealis*])

Moss layer: well developed and continuous.

- Hylocomium splendens*
- Ptilium crista-castrensis*
- Pleurozium schreberi*

Environment/Soils

- Parent material: morainal blanket, fluvial fan, glaciofluvial and colluvial veneer over morainal blanket
- Soil development: Orthic Dystric Brunisol, Orthic Humo-Ferric Podzol, Eluviated Dystric Brunisol, Orthic Gray Luvisol
- Humus form: Hemimor, Mormoder, Humimor
- Humus depth (cm): 3–28
- Coarse fragments (%): 5–70
- Soil texture: sandy loam to clay loam

- Moisture regime: mesic (subhygric)
- Nutrient regime: medium (rich)

Slope (%): 5–45

Aspect (o): all

Comments: This unit is predominant on the slopes of the Kispiox Range. Stands are often in excess of 200 years old; structurally and floristically more diverse than successional stages 4–6.

ICHmc2 Submesic moss site unit (6 plots)

Vegetation

Trees: well developed and continuous (mean cover 63%).

- A1 (western hemlock
(lodgepole pine [*Pinus contorta* var *latifolia*]))
- A2 western hemlock
(western redcedar)
- A3 western hemlock

Shrubs: patchy and sometimes nearly lacking.

- western hemlock
(black huckleberry [*Vaccinium membranaceum*])

Herbs: very sparse and poorly developed.

- (prince's pine [*Chimaphila umbellata*])
(bunchberry)
(one-sided wintergreen)

Moss layer: well developed and continuous.

- Hylocomium splendens*
- Pleurozium schreberi*
(*Ptilium crista-castrensis*)

Environment/soils

- Parent material: glaciofluvial terrace, glaciofluvial ridge, pebbly morainal blanket
- Soil development: Eluviated Dystric Brunisol, Orthic Dystric Brunisol
- Humus form: Hemimor
- Humus depth (cm): 4–17
- Coarse fragments (%): 80–90
- Soil texture: sand to silt loam

Moisture regime: submesic (mesic)

Nutrient regime: poor

Slope (%): 0–45

Aspect (o): all

Comments: This unit always occurs as a minor component within an HM matrix, and is virtually indistinguishable from the HM unit except on the basis of parent material texture.

ICHmc2 HM(1) Hemlock–moss site unit; mixed wood seral association (11 plots)

Vegetation

Trees: patchy, discontinuous, diverse, often with large stand openings (mean cover 40%).

- A1 black cottonwood [*Populus balsamifera* ssp. *trichocarpa*] (hybrid white spruce)
- A2 paper birch (hybrid white spruce) (western redcedar) (subalpine fir)
- A3 (western redcedar) (subalpine fir)

Shrubs: well developed, robust, and often patchy. thimbleberry [*Rubus parviflorus*] highbush-cranberry [*Viburnum edule*] (western redcedar) (subalpine fir) (prickly rose [*Rosa acicularis*]) (black twinberry [*Lonicera involucrata*]) (alder [*Alnus* spp.]) (hybrid white spruce) (red-osier dogwood [*Cornus stolonifera*])

Herbs: patchy, diverse, and often vigorous. bunchberry trailing raspberry [*Rubus pubescens*] (wild sarsaparilla [*Aralia nudicaulis*]) (palmate coltsfoot [*Petasites palmatus*]) (sweet-scented bedstraw [*Galium triflorum*]) (oak fern) (queen's cup [*Clintonia uniflora*]) (pink wintergreen [*Pyrola asarifolia*]) (twinlineflower) (false Solomon's-seal [*Smilacina racemosa*]) (purple peavine [*Lathyrus nevadensis*])

Moss layer: patchy and poorly developed. *Rhytidiadelphus triquetrus* *Mnium* spp. (*Ptilium crista-castrensis*)

Environment/Soils

Parent material: morainal blanket, glaciofluvial blanket
 Soil development: Brunisolic Gray Luvisol, Orthic Dystric Brunisol
 Humus form: Mormoder, Hemimor, Velomoder, Leptomoder
 Humus depth (cm): 5–14
 Coarse fragments (%): 10–80
 Soil texture: loam to clay loam
 Moisture regime: mesic to subhygric
 Nutrient regime: medium to rich
 Slope (%): 5–45
 Aspect (o): all

Comments: The Hemlock–Moss (1) site unit occupies similar landscape positions to the Hemlock–Moss unit on rolling moraine, and yet appears to be slightly richer and moister. The soil texture is finer and Brunisolic Gray Luvisols rather than Dystric Brunisols are the dominant soils. On these sites there is no clear-cut successional movement to a climax state, rather a seral equilibrium.

ICHmc2 OF (Oak fern site unit)

Vegetation

Trees: moderately well developed with low diversity (mean cover 53%).
 A1 western hemlock (western redcedar)
 A2 western hemlock western redcedar
 A3 western hemlock (western redcedar)

Shrubs: patchy, with low diversity. devil's club [*Oplopanax horridus*] western hemlock (western redcedar) (amabilis fir) (false azalea)

Herbs: well developed, patchy to continuous, dominated by oak fern.

oak fern
 bunchberry
 five-leaved bramble
 (one-sided wintergreen)
 (queen's cup)
 (clasping twistedstalk [*Streptopus amplexifolius*])
 (spiny wood fern [*Dryopteris assimilis*])

Moss layer: well developed and continuous.

Hylocomium splendens
Pleurozium schreberi
Ptilium crista-castrensis
Rhytidiadelphus triquetrus

Environment/Soils

Parent materials: morainal blanket, fluvial fan, colluvial veneer over morainal blanket
 Soil development: Gleyed Dystric Brunisol, Eluviated Dystric Brunisol, Orthic Regosol, Cumulic Regosol, Orthic Humo-Ferric Podzol, Orthic Gray Luvisol, Orthic Sombric Brunisol, Gleyed Brunisolic Gray Luvisol
 Humus form: Mormoder, Hemimor, Leptomoder, Hemihumimor, Velomormoder, Velomor
 Humus depth (cm): 2–26
 Coarse fragments (%): 0–75
 Soil texture: coarse sand to clay loam

Moisture regime: subhygric (mesic)
 Nutrient regime: rich (medium)

Slope (%): 5–70
 Aspect (o): 350–90

Comments: This unit occurs on a variety of soil developments, but primarily on fluvial fan material and fine-textured moraine. Although devil's club is always present it never achieves higher than 15% cover.

ICHmc2 DC Devil's club site unit (24 plots)

Vegetation

Trees: patchy, discontinuous, and usually very open (mean cover 34%).

A1 (hybrid white spruce)

(western redcedar)
 (western hemlock)
 A2 western hemlock
 (western redcedar)
 (hybrid white spruce)
 (subalpine fir)
 A3 (western hemlock)
 (western redcedar)

Shrubs: patchy to continuous, robust, and always dominated by devil's club.

devil's club
 western hemlock
 (black gooseberry [*Ribes lacustre*])
 (western redcedar)
 (highbush-cranberry)
 (thimbleberry)
 (red-osier dogwood)

Herbs: vigorous, patchy to continuous.

oak fern
 three-leaved foamflower [*Tiarella trifoliata*]
 bunchberry
 lady fern [*Athyrium filix-femina*]
 (spiny wood fern)
 (enchanter's nightshade [*Circaea alpina*])
 (five-leaved bramble)
 (clasping twistedstalk)

Moss layer: discontinuous and vigorous.

Hylocomium splendens
Mnium spp.
Rhytidiadelphus triquetrus
 (*Ptilium crista-castrensis*)
 (*Pleurozium schreberi*)

Environment/Soils

Parent material: morainal blanket, lacustrine blanket, gullied morainal blanket, fluvial fan, fluvial plain
 Soil development: Orthic Regosol, Orthic Gleysol, Orthic Humic Gleysol, Gleyed Gray Luvisol, Gleyed Dystric Brunisol, Rego Gleysol, Gleyed Cumulic Regosol, Cumulic Regosol, Orthic Dystric Brunisol, Typic Humisol
 Humus form: Mormoder, Leptomoder, Hydro-moder, Velomoder, Hemimor

Humus depth (cm): 2–36
 Coarse fragments (%): 0–80
 Soil texture: loamy sand to clay

Moisture regime: subhygric to hygric
 Nutrient regime: rich

Slope (%): 0–35
 Aspect (o): variable

Comments: The Devil's club site unit occurs on a range of materials with varied soil development, although gleyed and regosolic soils are most common. Devil's club has a mean cover of 28%. The tree canopy is often minimal and some sites are shrub dominated.

ICHmc2 SL₃ Skunk cabbage–Lady fern site unit, shrub dominated (9 plots)

Vegetation

Trees: lacking or occasional individuals (mean cover 4%).
 A₁, A₂, A₃ (hybrid white spruce)

Shrubs: robust, tall, diverse, and continuous.
 mountain alder [*Alnus incana* ssp. *tenuifolia*]
 devil's club
 black twinberry
 (red-osier dogwood)

Herbs: vigorous, tall with low diversity.
 lady fern
 enchanter's nightshade
 oak fern
 (skunk cabbage [*Lysichiton americanum*]
 (three-leaved foamflower)
 (violet [*Viola* sp.]])

Moss layer: very low cover and diversity.
Mnium spp.

Environment/Soils

Parent material: gullied morainal blanket, glaciofluvial blanket, organic veneer over fluvial blanket, fluvial blanket, lacustrine blanket, organic blanket
 Soil development: Rego Gleysol, Rego Humic

Gleysol, Gleyed Cumulic Regosol, Terric Humisol, Typic Mesisol
 Humus form: Leptomoder, Hydromoder, Velomoder, Hydromor, Hydromormoder, Histomoder
 Humus depth (cm): 1–18
 Coarse fragments (%): 0–80

Moisture regime: subhygric to subhydric
 Nutrient regime: rich to very rich

Slope (%): 0
 Aspect (o): not applicable

Comments: The Skunk cabbage–Lady fern site unit occurs distinctly as successional stage 3 (shrub dominated) and 6–7 (mature forest/old growth). The two forms exhibit significant differences in floristic diversity and cover values, although physical conditions do not differ.

ICHmc2 SL_{6–7} Skunk cabbage–Lady fern site unit, mature forest and old growth (11 plots)

Vegetation

Trees: discontinuous and very open (mean cover 28%).
 A₁ hybrid white spruce
 A₂ hybrid white spruce
 western redcedar
 (western hemlock)
 (subalpine fir)
 A₃ (hybrid white spruce)
 (western hemlock)

Shrubs: patchy and discontinuous, but robust.
 western hemlock
 western redcedar
 (mountain alder)
 (false azalea)
 (subalpine fir)
 (devil's club)
 (highbush-cranberry)

Herbs: diverse, vigorous, and continuous.
 skunk cabbage
 horsetail [*Equisetum* spp.]
 oak fern
 lady fern
 bunchberry

(trailing raspberry)
 (soft-leaved sedge [*Carex disperma*])
 (three-leaved foamflower)
 (sweet-scented bedstraw)
 (violet)
 (common mitrewort [*Mitella nuda*])
 (enchanter's nightshade)

Moss layer: patchy and discontinuous.

Mnium spp.
Hylocomium splendens
Rhytidiadelphus triquetrus

Environment/Soils

Parent material: organic blanket, lacustrine blanket, fluvial blanket, organic veneer over glaciofluvial blanket

Soil development: Rego Gleysol, Typic Humisol, Rego Humic Gleysol, Typic Mesisol, Terric Humisol

Humus form: Hydromoder, Saprimull, Histomoder, Hydromull

Humus depth (cm): 1–36

Coarse fragments (%): 0–2

Soil texture: loamy sand to heavy clay

Moisture regime: hygric to subhydryc

Nutrient regime: rich to very rich

Slope (%): 0

Aspect (o): not applicable

Comments: The forested stage of the Skunk cabbage–Lady fern site unit consistently has higher cover values for skunk cabbage and horsetail than the shrub stage. A number of species such as false azalea and bunchberry grow on raised organic mounds in this unit.

ICHmc2 FW Forested Wetland site unit (7 plots)

Vegetation

Trees: open with reduced growth form (mean cover 16%).

A1 black spruce [*Picea mariana*]
 A2 (black spruce)
 (paper birch)
 A3 (black spruce)

Shrubs: patchy and sparse, and low in stature.

Labrador tea [*Ledum groenlandicum*]
 (hardhack [*Spiraea douglasii*])
 (scrub birch [*Betula glandulosa*])
 (mountain alder)

Herbs: continuous, with relatively low diversity.

sedge [*Carex* spp.]
 (horsetail)
 (marsh cinquefoil [*Potentilla palustris*])
 (bog cranberry [*Vaccinium oxycoccos*])
 (skunk cabbage)
 (buckbean [*Menyanthes trifoliata*])
 (twinflower [*Linnaea borealis*])
 (dwarf nagoonberry)

Moss layer: thick, spongy peat moss.

Sphagnum spp.
(Pleurozium schreberi)
(Aulacomnium palustre)

Environment/Soils

Parent material: organic blanket

Soil development: Typic Mesisol, Typic Humisol, Typic Fibrisol

Humus form: Histomoder, Saprimull, Histomor

Humus depth (cm): 2–14

Moisture regime: subhydryc

Nutrient regime: very poor to poor

Slope (%): 0

Aspect (o): not applicable

Comments: This unit, which is mapped as a forested wetland, has low cover values for the tree layer, but is treed relative to other wetlands.

ICHmc2 SW Shrub Wetland site unit (7 plots)

Vegetation

Trees: scattered individuals or not present.

Shrubs: usually continuous, sometimes patchy.
 hardhack [*Spiraea douglasii*]
 mountain alder
 (scrub birch)

(Labrador tea [*Ledum groenlandicum*])
(hybrid white spruce)

Herbs: continuous, homogenous, usually dominated by a few species.

sedge
skunk cabbage
(violet)
(bluejoint [*Calamagrostis canadensis*])
(cloudberry [*Rubus chamaemorus*])
(marsh cinquefoil)

Moss layer: diverse and highly variable.

(*Sphagnum* spp.)
(*Pleurozium schreberi*)
(*Calliergon* sp.)
(*Tomenthypnum nitens*)
(*Mnium* spp.)

Environment/Soils

Parent material: organic blanket, fluvial veneer over lacustrine, organic veneer over lacustrine materials

Soil development: Typic Humisol, Typic Fibrisol,

Typic Mesisol, Terric Mesisol, Rego Gleysol

Humus form: Histomor, Saprimull, Hydromor, Hydromoder

Humus depth (cm): 2–36

Soil texture: clay (2 samples)

Moisture regime: subhygric to hydric

Nutrient regime: rich to very rich

Slope (%): 0

Aspect (o): not applicable

Comments: The Shrub Wetland unit is variable in species composition and can be dominated by mountain alder, hardhack, or scrub birch. These sites are often transitional to and adjacent to the Herb Wetland unit.

ICHmc2 HW Herb Wetland (9 plots)

Vegetation

Trees: lacking or occasional stunted individuals.

Shrubs: patchy and discontinuous, often on perimeter.

(Labrador tea [*Ledum groenlandicum*])
(scrub birch)
(willow [*Salix* spp.])
(lodgepole pine)
(black spruce)

Herbs: diverse and continuous, sometimes with low cover values.

sedge
bog cranberry
narrow-leaved cotton-grass [*Eriophorum angustifolium*])
(buckbean)
(bog-laurel [*Kalmia microphylla*])
(round-leaved sundew [*Drosera rotundifolia*])
(white bog-orchid [*Platanthera dilatata*])
(bog-rosemary [*Andromeda polifolia*])

Moss layer: thick, continuous, peat moss.

Sphagnum spp.
(*Tomenthypnum nitens*)
(*Calliergon* sp.)

Environment/Soils

Parent material: organic blanket, organic veneer over morainal blanket

Soil development: Typic Mesisol, Typic Humisol,

Mesic Humisol, Typic Fibrisol, Rego Gleysol

Humus form: Histomoder, Saprimull, Histomor, Hydromor

Humus depth (cm): 5–12

Coarse fragments (%): 30 (1 sample)

Soil texture: sandy clay loam

Moisture regime: subhydric to hydric

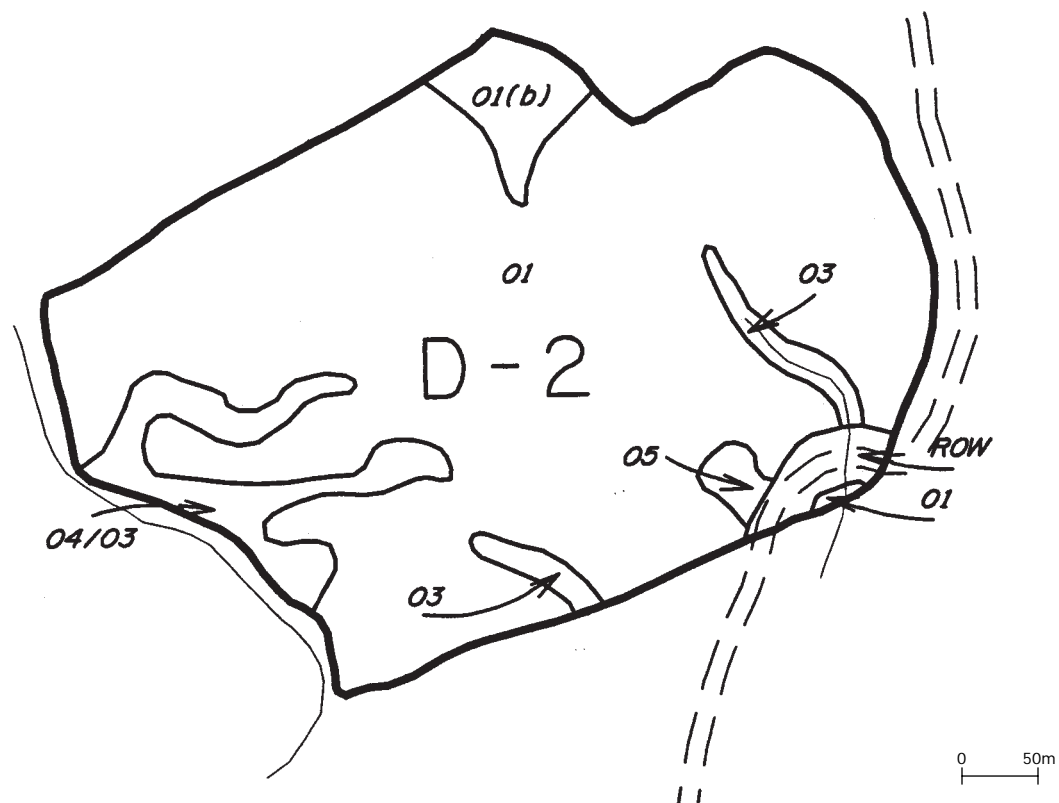
Nutrient regime: oligotrophic to eutrophic

Slope (%): 0

Aspect (o): not applicable

Comments: The Herb Wetland is relatively homogenous, and is often dominated by a few species, with a continuous cover of peat moss. Sedge species include *Carex diandra*, *C. disperma*, *C. interior*, *C. limosa*, *C. pauciflora*, and *C. sitchensis*.

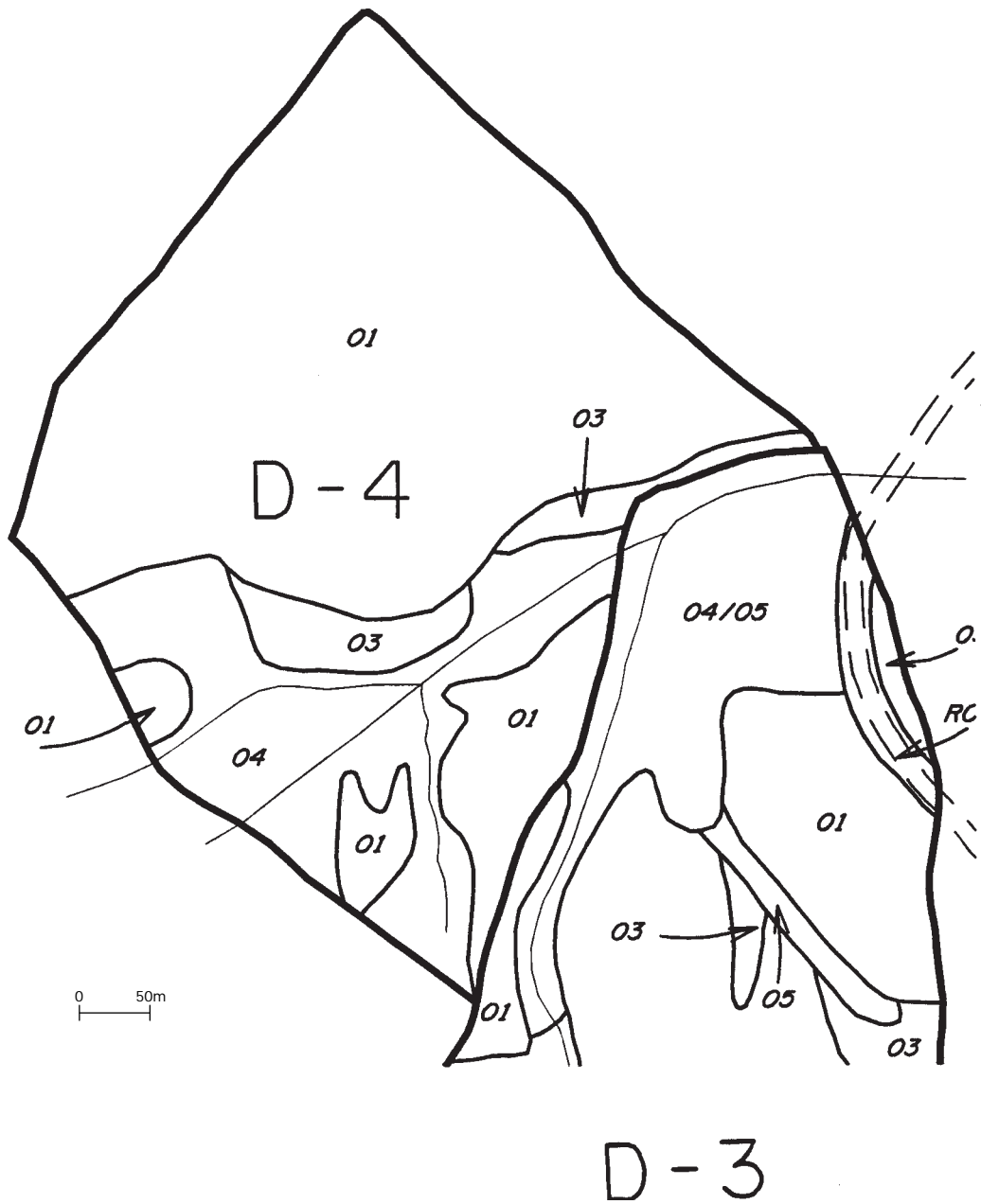
The following maps present the site series distribution for each treatment unit (scale = 1:5000). Site series are described in Banner et al. (1993).



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

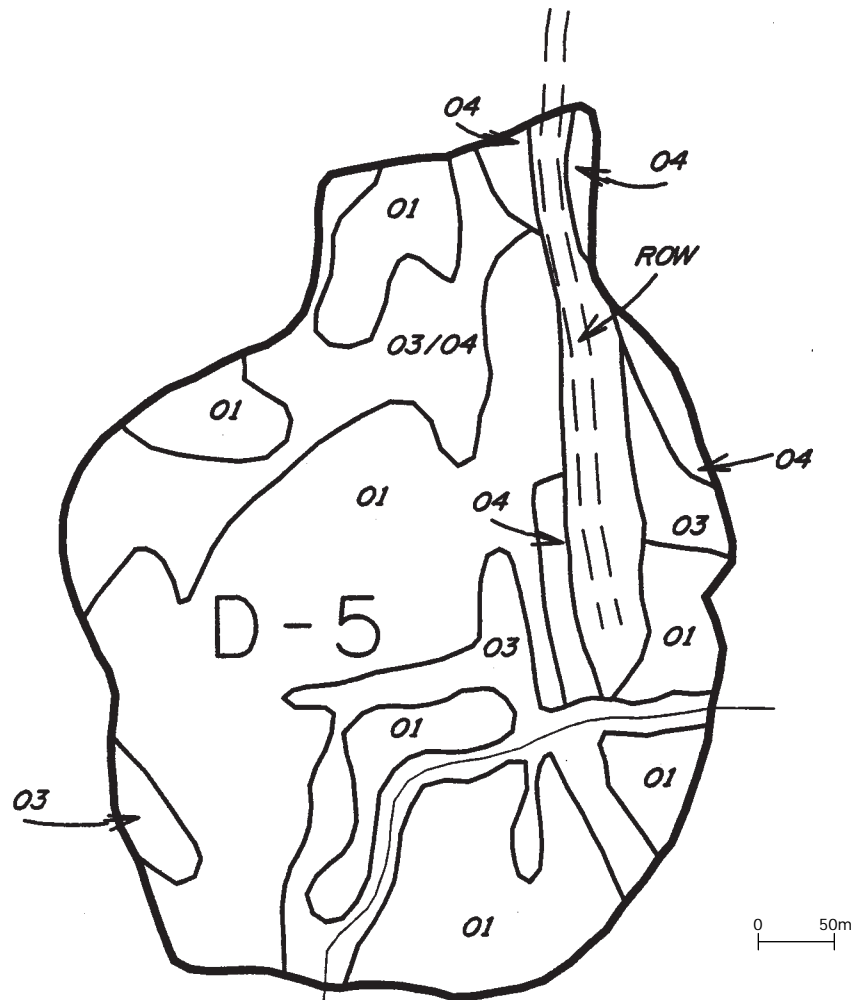
FIGURE A4.1 Map of treatment unit D2 with site series distribution.



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

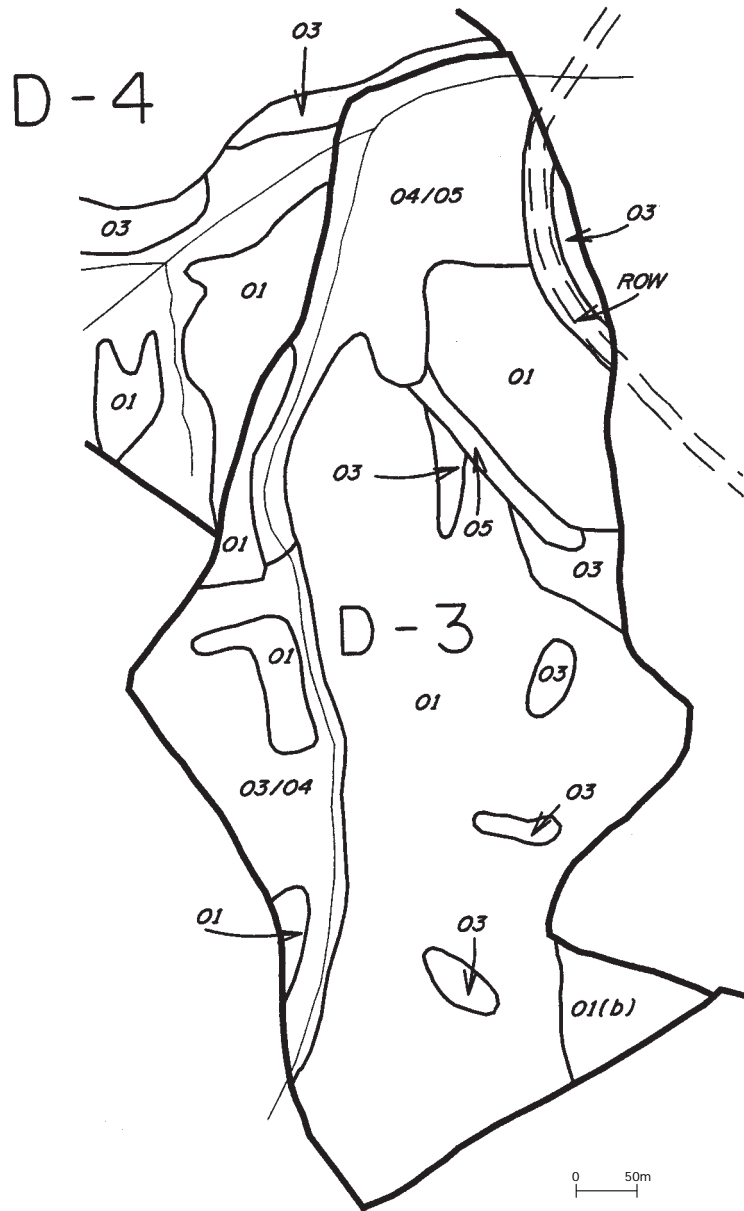
FIGURE A4.2 *Map of treatment unit D4 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

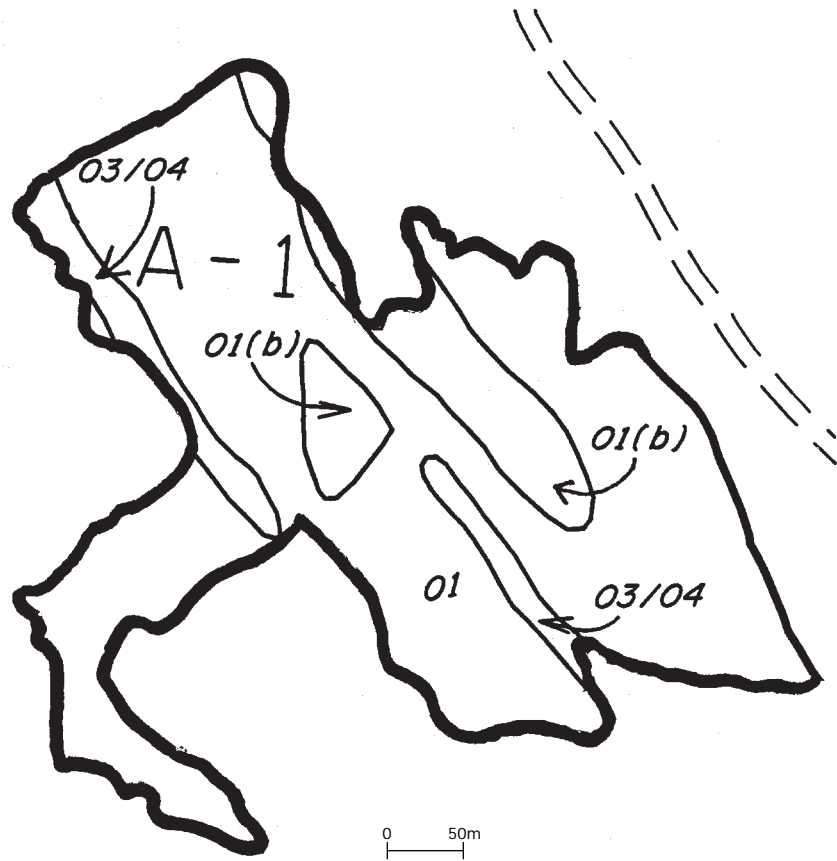
FIGURE A4.3 *Map of treatment unit D5 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

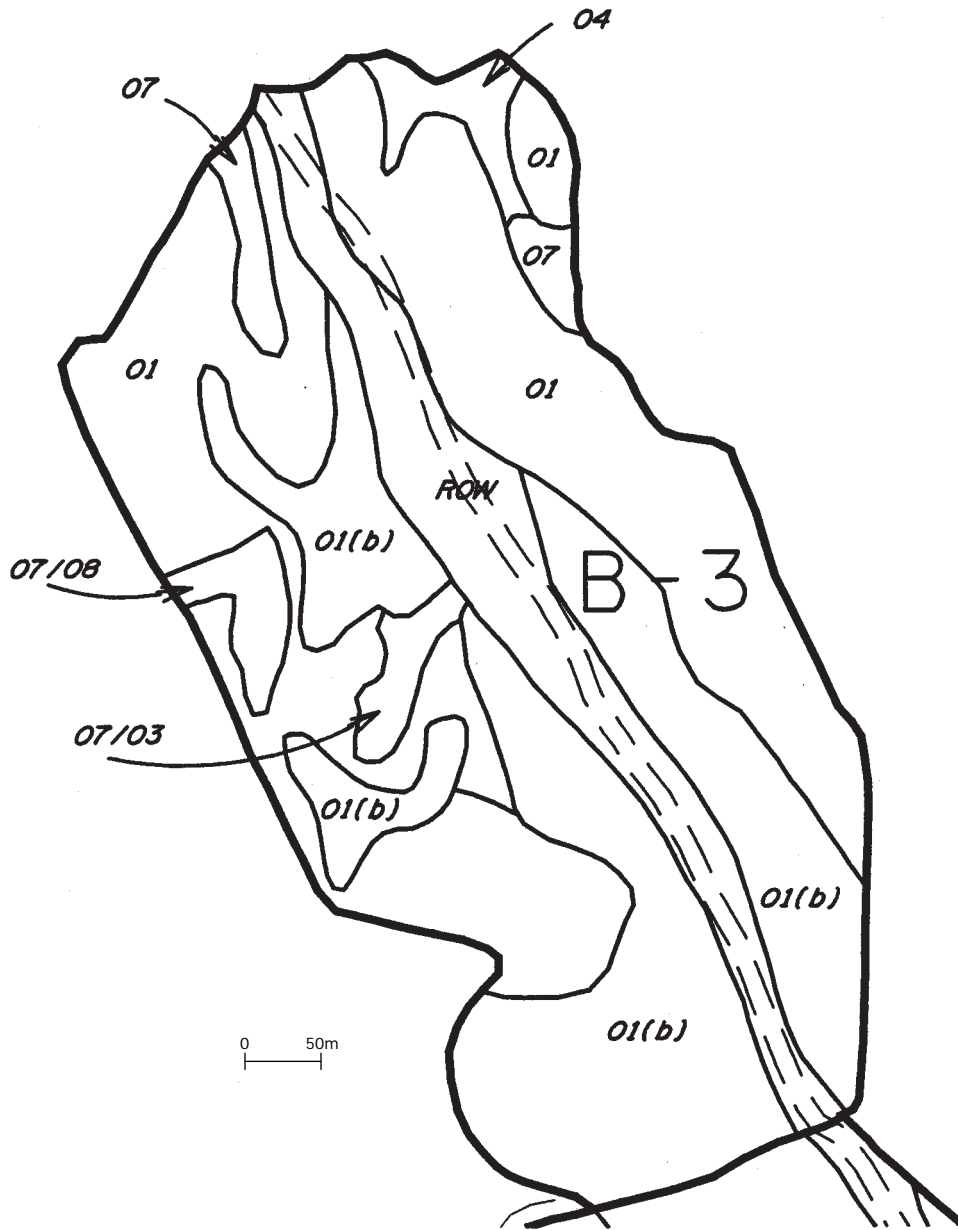
FIGURE A4.4 *Map of treatment unit D3 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

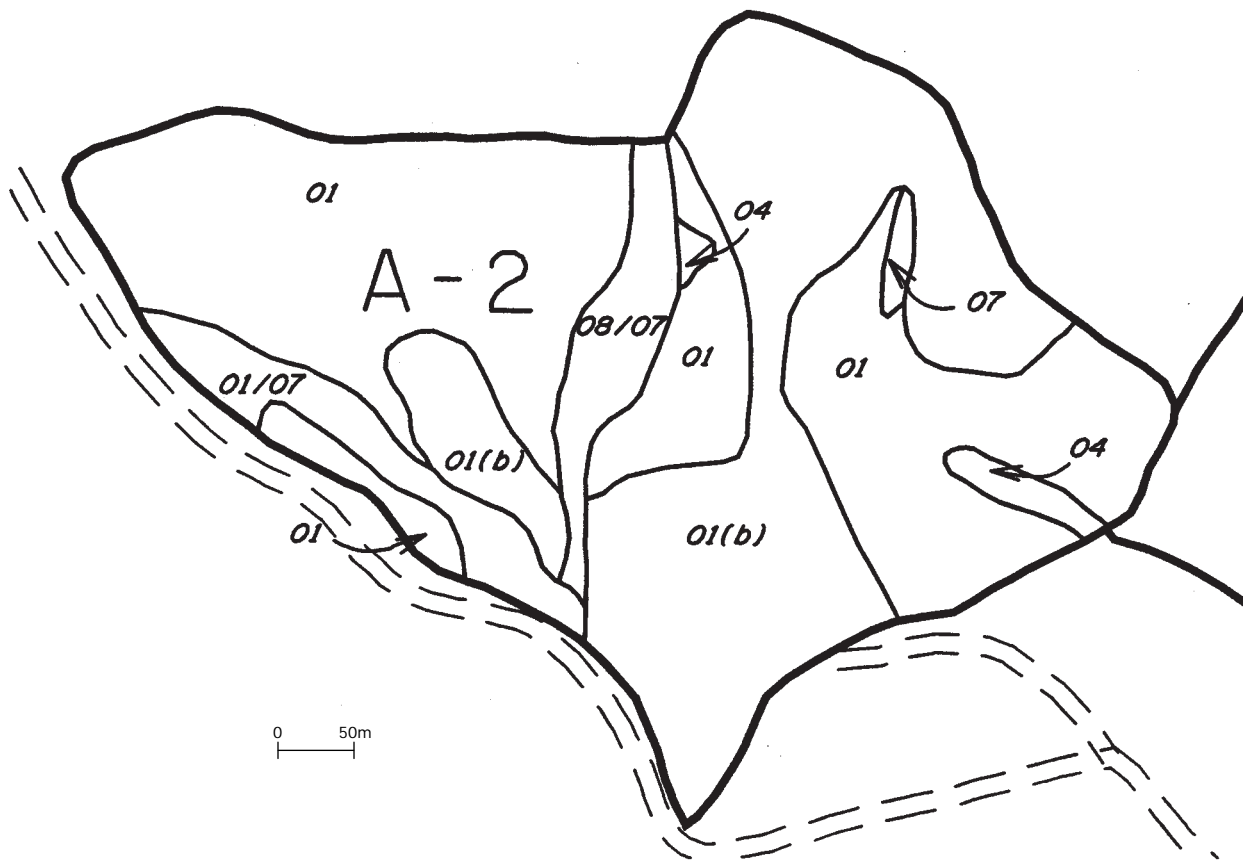
FIGURE A4.5 *Map of treatment unit A1 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

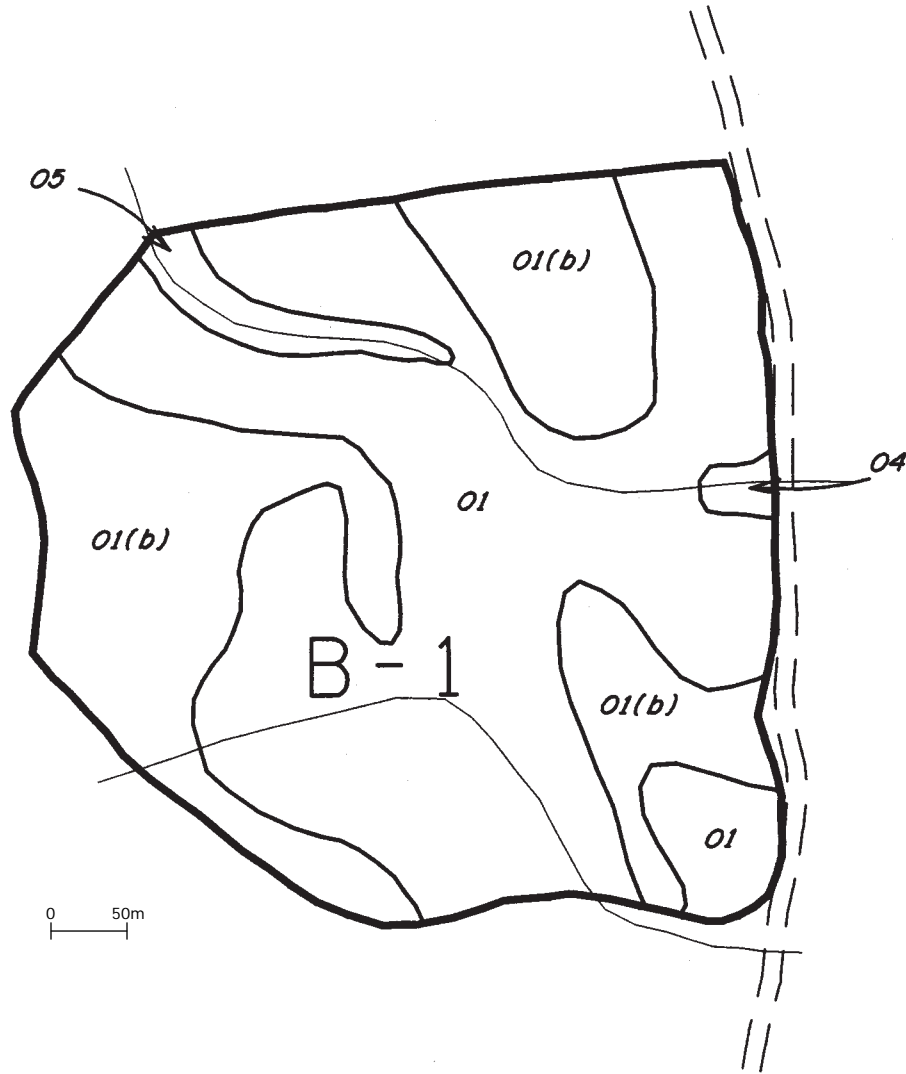
FIGURE A4.6 *Map of treatment unit B3 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

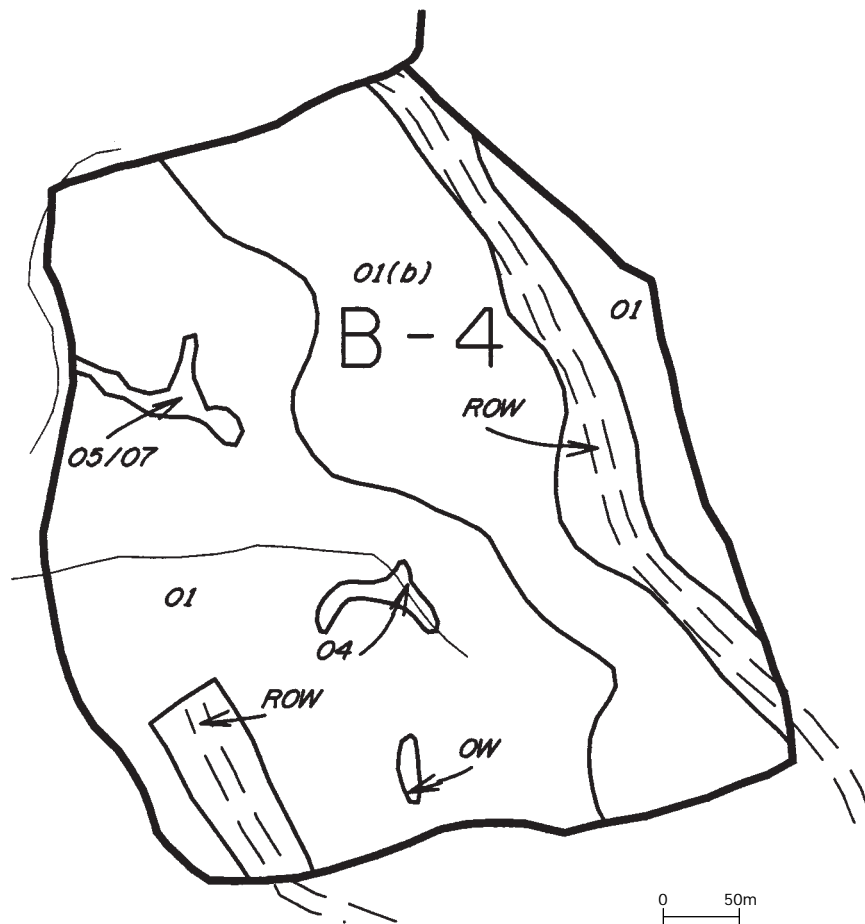
FIGURE A4.7 *Map of treatment unit A2 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

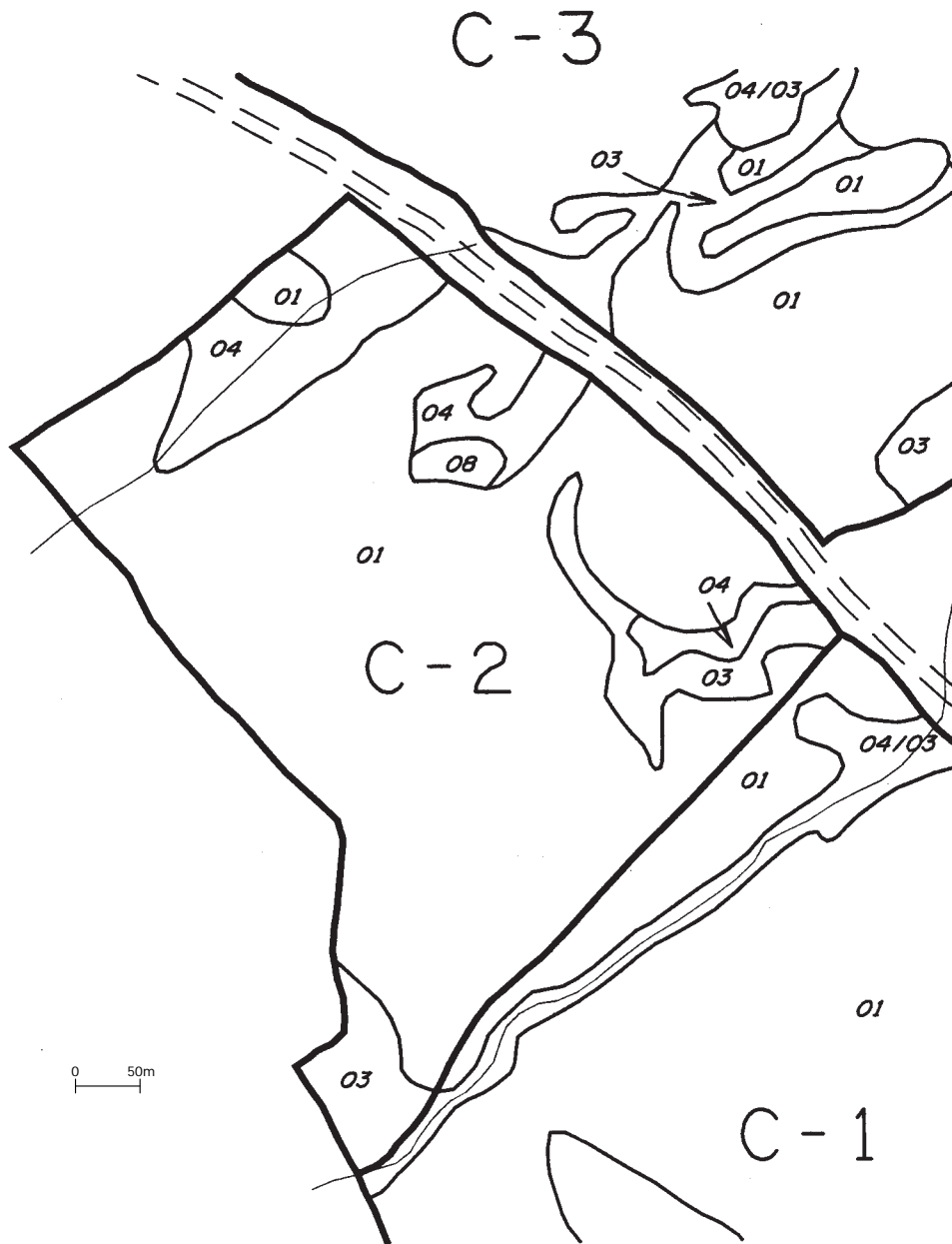
FIGURE A4.8 *Map of treatment unit B1 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

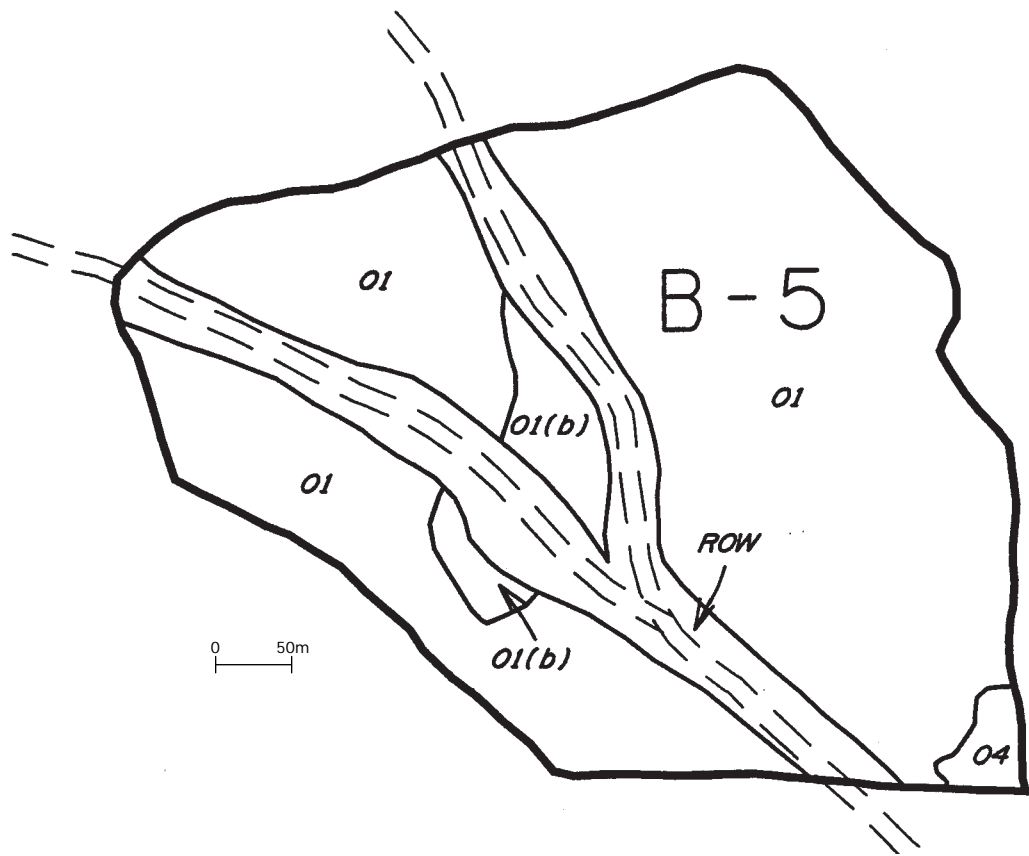
FIGURE A4.9 *Map of treatment unit B4 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

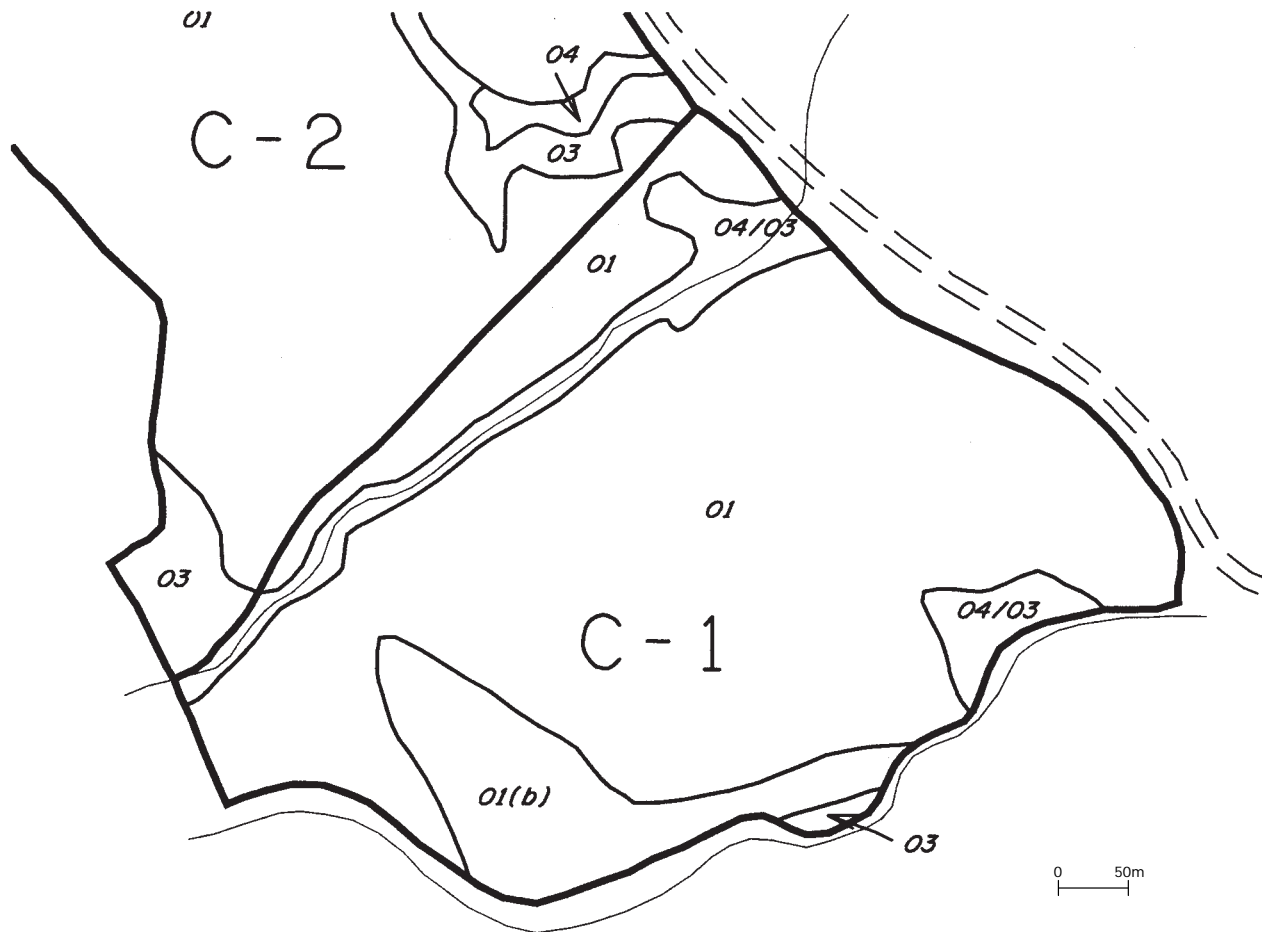
FIGURE A4.10 *Map of treatment unit C2 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

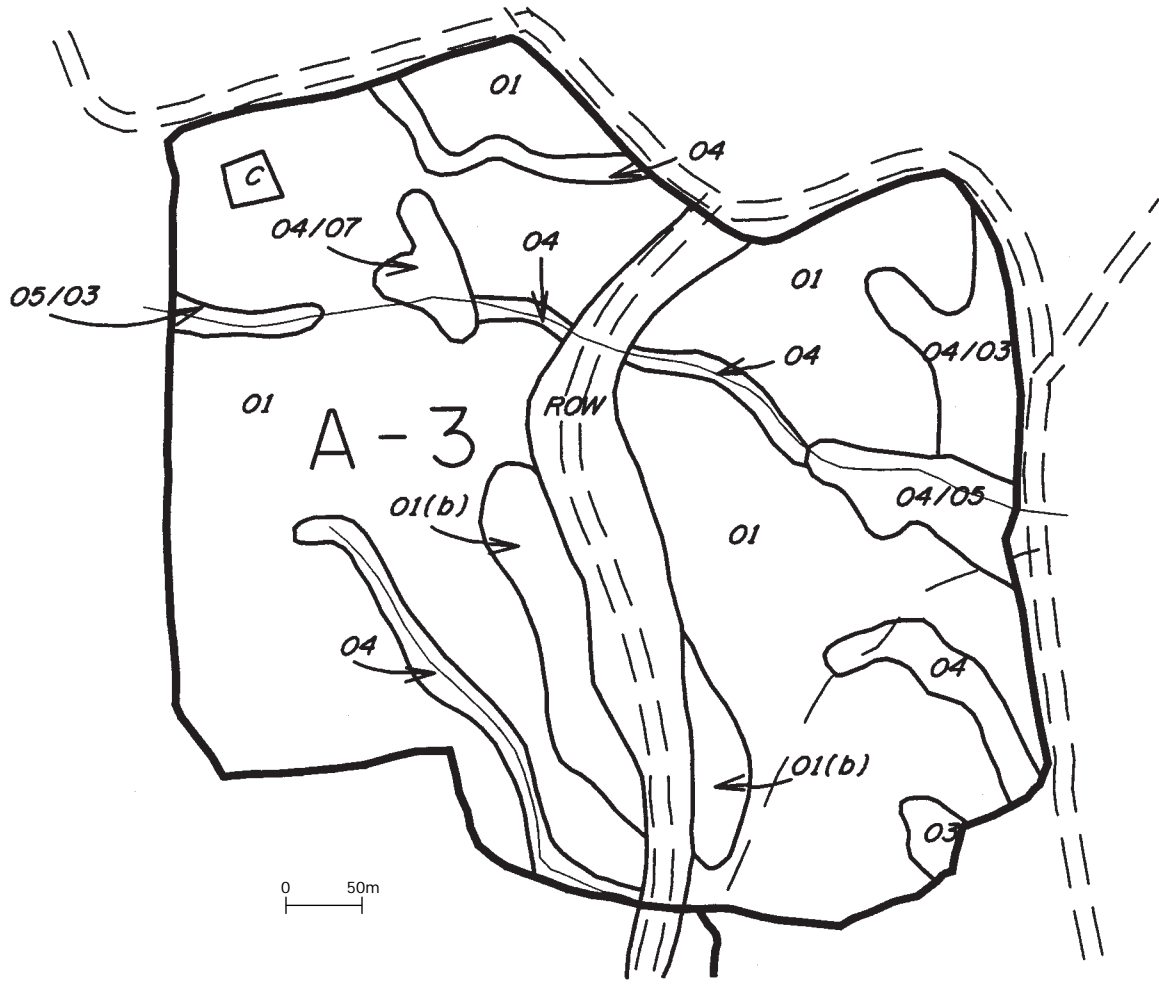
FIGURE A4.11 *Map of treatment unit B5 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

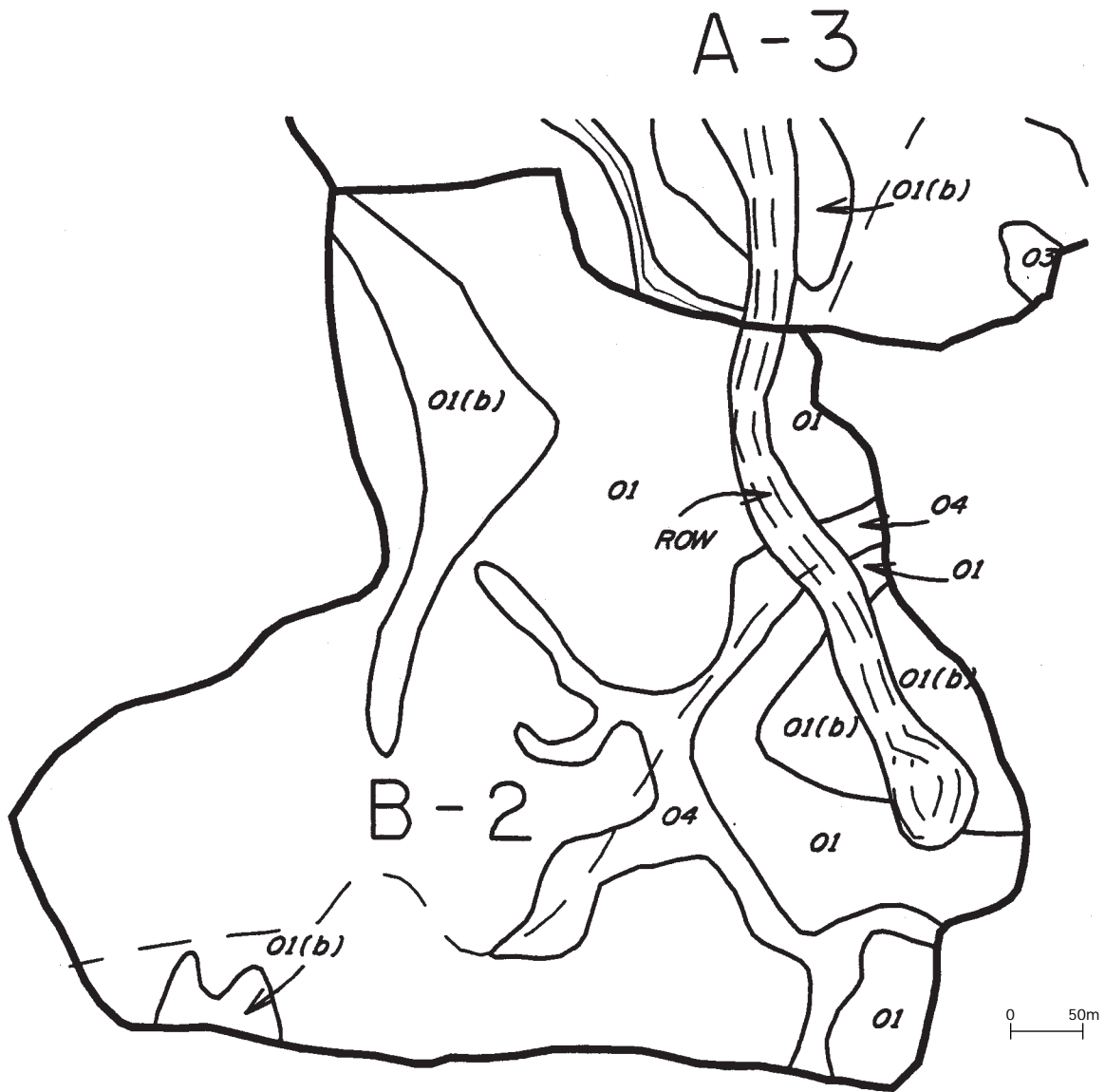
FIGURE A4.12 *Map of treatment unit C1 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

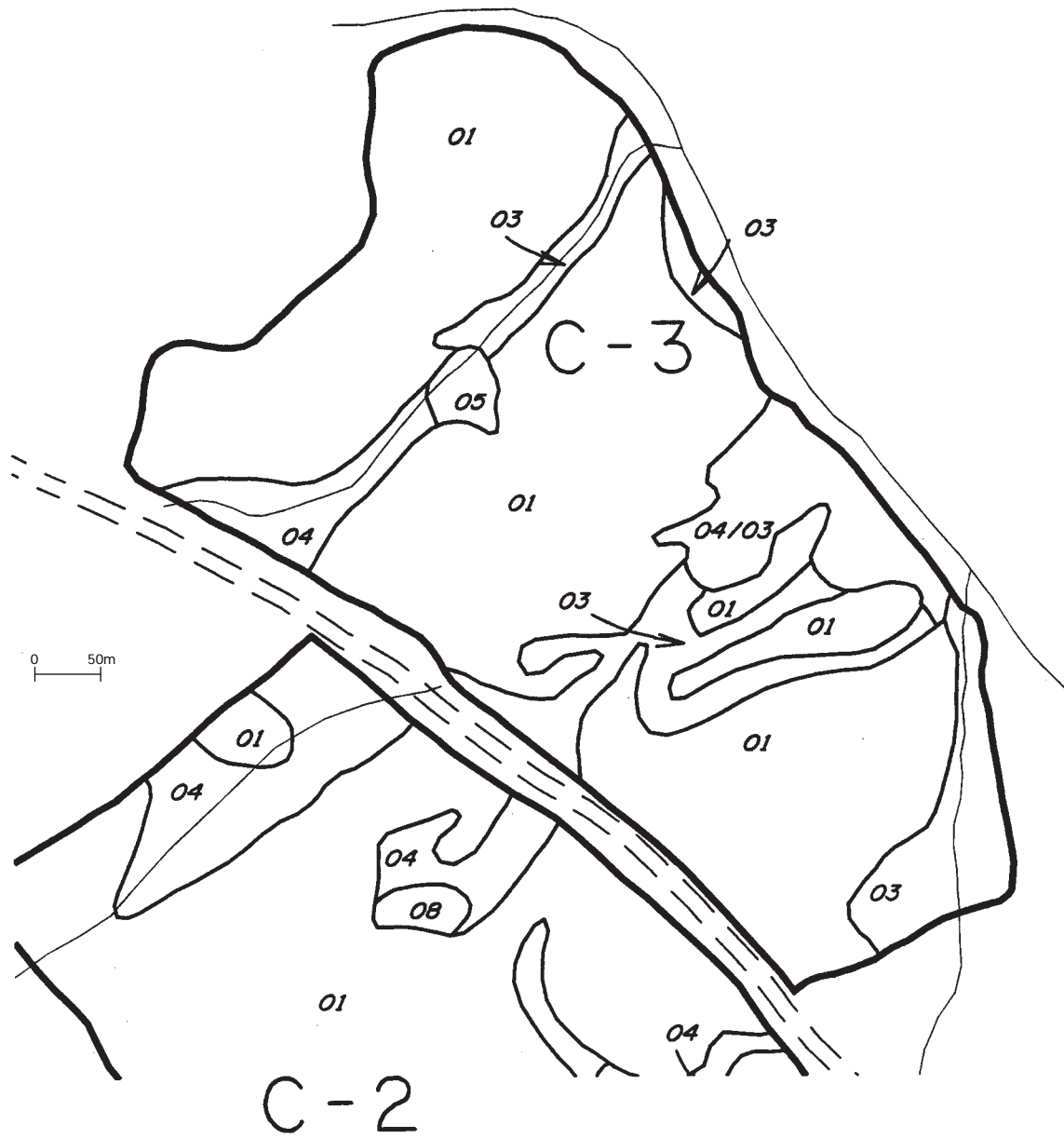
FIGURE A4.13 *Map of treatment unit A3 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

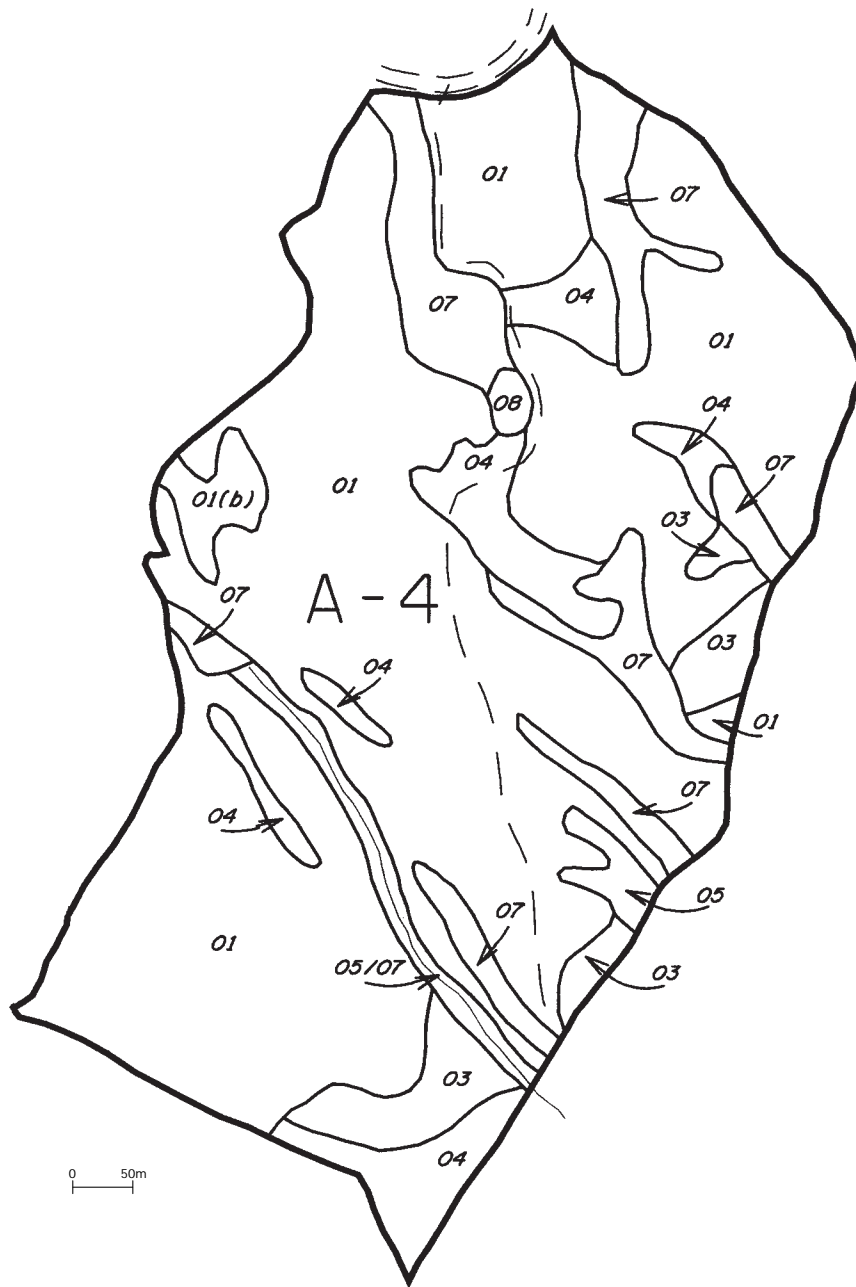
FIGURE A4.14 *Map of treatment unit B2 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

FIGURE A4.15 *Map of treatment unit C3 with site series distribution.*



INDIVIDUAL TREATMENT UNIT MAP			
MAP CODE	SITE SERIES ^a	MAP CODE	SITE SERIES
01	Hemlock-Step moss (mesic phase)	07	Cedar-Spruce-Horsetail-Skunk cabbage
01(b)	Hemlock-Step moss (submesic phase)	08	Black spruce-Hybrid spruce-Scrub birch-Sedge (forested swamp)
03	Hemlock-Cedar-Oak fern	ow	Open water
04	Cedar-Hemlock-Devil's club-Oak fern	row	Right-of-way
05	Spruce-Devil's club-Lady fern		

^a Site series as described in Banner et al. 1993

FIGURE A4.16 *Map of treatment unit A4 with site series distribution.*

- Agriculture Canada Expert Committee on Soil Survey. 1987. The Canadian system of soil classification. Agric. Can., Ottawa, Ont., Agric. Can. Pub. No. 1646.
- Banner, A., W. MacKenzie, S. Haeussler, S. Thompson, J. Pojar and R. Trowbridge. 1993. A field guide to site identification and interpretation for the Prince Rupert Forest Region. Part I. Research Branch, B.C. Min. For., Res. Br., Victoria, B.C.
- British Columbia Ministry of Forests. 1994. Annual report of the Ministry of Forests for fiscal year ending March 1994. B.C. Min. For., Victoria, B.C.
- Burns, R.M. and B.H. Honkala. (technical coordinators). 1990. Silvics of North America. Vol. 1 and 2. U.S. Dep. Agric., For. Serv., Washington, D.C. Agric. Handb. No. 654.
- Clement, C.J.E. and A. Banner. 1992. Ecosystem mapping of the Date Creek silvicultural systems research area, Prince Rupert Forest Region. B.C. Min. For., For. Sci. Sec., Smithers, B.C. Unpubl.
- Coates, K.D., S. Haeussler, S. Lindeburgh, R. Pojar, and A.J. Stock. 1994. Ecology and silviculture of interior spruce in British Columbia. B.C. Min. For. and For. Can., Victoria, B.C. FRDA Rep. No. 220.
- Colquhoun, B. and A. Macadam. 1993. Soils of the Date Creek experimental area, Prince Rupert Forest Region. B.C. Min. For., For. Sci. Sec., Smithers, B.C.
- Demarchi, D.A., R.D. Marsh, A.P. Harcombe, and E.C. Lea. 1990. The environment. *In* The birds of British Columbia. R.W. Campbell, N.K. Dawe, I. McTaggart-Cowan, J.M. Cooper, G.W. Kaiser and M.C.E. McNall (editors.), 1: 55-144. Royal B.C. Mus., Victoria, B.C..
- Environment Canada. 1994. Canadian Climate Data, 1973-1992. Environ. Can., Climatic Services, Vancouver, B.C.
- Green, R.N., R.L. Trowbridge, and K. Klinka. 1993. Towards a taxonomic classification of humus forms. For. Sci. Monogr. 29.
- Haeussler, S., J. Pojar, B.M. Geisler, D. Yole, and R.M. Annas. 1985. A guide to the Interior Cedar-Hemlock zone, Northwestern Transitional Subzone (ICHg) in the Prince Rupert Forest Region, British Columbia. B.C. Min. For. Lands, Victoria, B.C. Land Man. Rep. No. 26.
- Hamilton, E. 1988. A system for the classification of seral ecosystems within the biogeoclimatic ecosystem classification. First approx. B.C. Min. For. Lands, Victoria, B.C. Res. Rep. RR87004-HQ.
- Krajina, V.J., K. Klinka, and J. Worrall. 1982. Distribution and ecological characteristics of trees and shrubs of British Columbia. Univ. B.C., Fac. For., Vancouver, B.C.
- Krajina, V.J. 1969. Ecology of forest trees in British Columbia. Ecology of Western North America 2(1):1-146.
- LePage, P. 1995. The structure and development pattern of mixed-species forest stands in the Interior Cedar-Hemlock zone; Moist Cold subzone of northwestern British Columbia. M.Sc. thesis. Oreg. State Univ., Corvallis, Oreg.
- Lofroth, E.C. 1992. Measurement of habitat elements at the stand level. *In* Methodology for monitoring wildlife diversity in B.C. forests. Workshop proc., B.C. Min. Environ., Lands and Parks, Wildl. Branch, Victoria, B.C.
- Luttermerding H. A., D.A. Demarchi, E.C. Lea, D. V. Meidinger, and T. Vold. 1990. Describing ecosystems in the field. 2nd ed. B.C. Min. Environ. and B.C. Min. For., Victoria, B.C. M.O.E. Man. No. 11.
- Matthews, J.D. 1989. Silvicultural systems. Oxford Scientific Publications, Clarendon Press.
- Meidinger, D. and J. Pojar. 1991. Ecosystem of

- British Columbia. B.C. Min. For., Victoria, B.C. Spec. Rep. Ser. No. 6.
- Minore, D. 1979. Comparative autecological characteristics of northwestern tree species: a literature review. U.S. Dept. Agric., For. Ser., Pac. Northwest For. Range Exp. Stat., Portland, Oreg.
- Olderwald, R.G. and E. Jones. 1992. Sample sizes for point, double sampling. *Can. J. For. Res.* 22: 980-3.
- Parminter, J. 1990. Typical historic patterns of wild-fire disturbance by biogeoclimatic zone. *In* Old Growth forests: problem analysis. B.C. Min. For., Res. Br., Victoria, B.C.
- Pojar, J., K. Klinka, and D.V. Meidinger. 1987. Biogeoclimatic ecosystem classification in British Columbia. *For. Ecol. Manage.* 22:119-54.
- Smith, D.M. 1993. Silvicultural systems program: British Columbia Ministry of Forests. B.C. Min. For., Res. Br., Victoria, B.C.
- Thibodeau, E.D., R.K. Krag, and I.B. Hedin. 1996. Date Creek Silvicultural systems trial: performance and productivity of ground-based harvesting systems in the Interior Cedar-Hemlock Ecosystem of the Prince Rupert Forest Region. FERIC report, Vancouver, B.C. Unpubl.
- Trowbridge, R., B. Hawkes, A. Macadam, and J. Parminter. 1986. Field handbook for prescribed fire assessment in British Columbia: logging slash fuels. B.C. Min. For., Res. Br., Victoria, B.C., Land Man. Handb. No. 11.
- Van Wagner, C.E. 1968. The line intersect method of forest fuel sampling. *For. Sci.* 14:20-6.
- Weetman, G.F. 1995. Are European silvicultural systems and precedents useful for British Columbia silviculture prescriptions? B.C. Min. For., Silvi. Br., Victoria, B.C.
- Westoff, V. and W. van der Maarel. 1978. The Braun-Blanquet approach. *In* Classification of plant communities. R.H. Whittaker (editor), Dr. W. Junk, B.V, The Hague, The Netherlands.
- Wildlife Tree Committee of British Columbia. 1992. Wildlife/danger tree assessor's course: workbook. B.C. Min. For. and For. Can., Victoria, B.C.