BC Parks Project

Mt. Tzuhalem Ecological Reserve

Recreational & Ecological Impact Monitoring

Resource Management Officer
Technology Students
October 2006

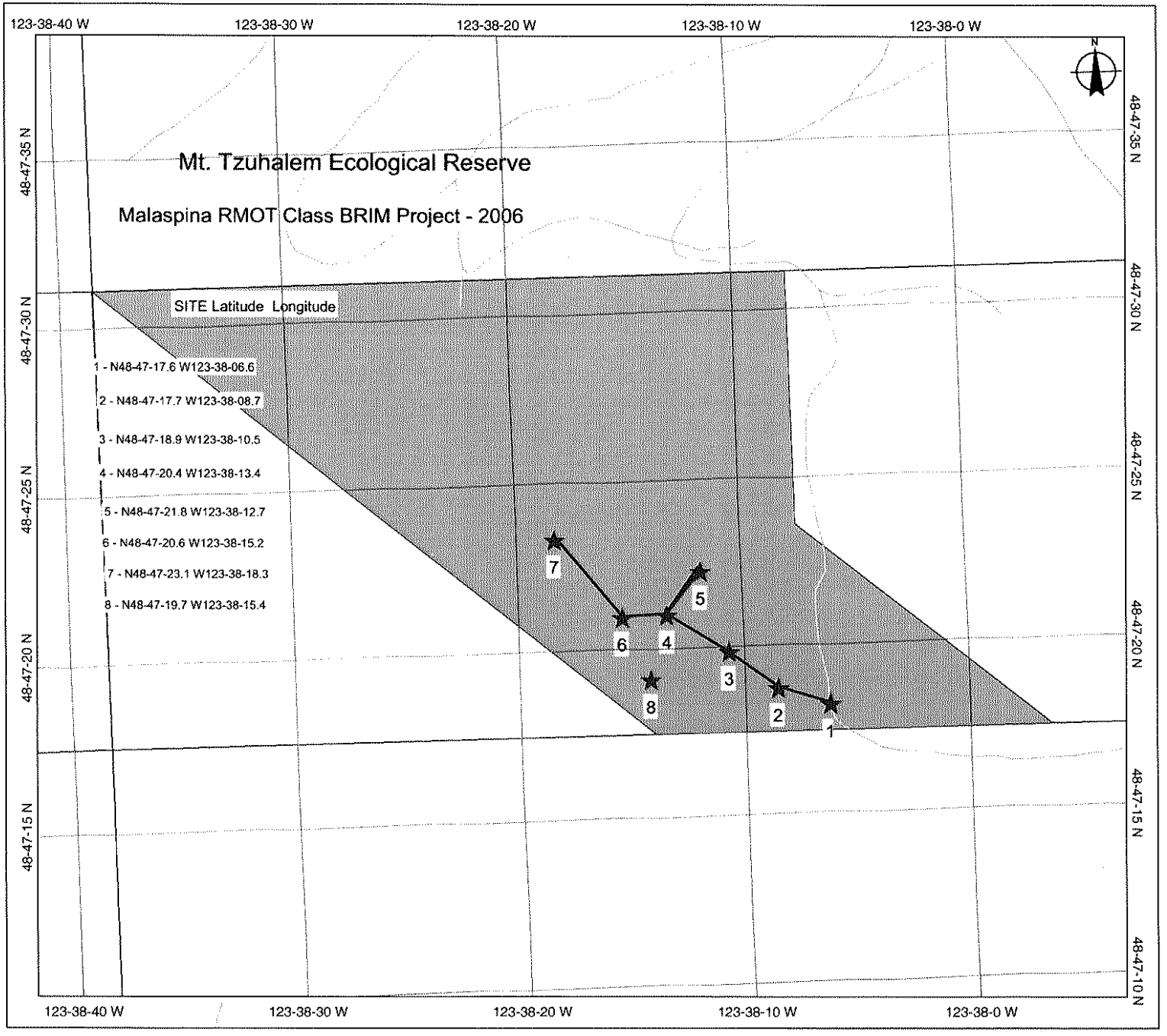
Mt. Tzuhalem ER: Main Trail System :

Position- Site 1	123° 38' 6.2" W 48° 47' 18.2" N
Position- Site 2	123° 38' 8.5" W 48° 47' 18.8" N
Distance	50.2 m
True Course	289.7°
Position- Site 3	123° 38' 10.6" W 48° 47' 19.8" N
Distance	53.3 m
True Course	306.9°
Position- Site 4	123° 38' 13.4" W 48° 47' 21.0" N
Distance	67.5 m
True Course	302.8°
Position– Site 6	123° 38' 15.4" W 48° 47' 20.9" N
Distance	39.7 m
True Course	267.5°
Position- Site 7	123° 38' 18.2" W 48° 47' 23.3" N
Distance	93.2 m
True Course	321.9°
Total	304.0 m

Spur Trail to Trail Closed Fence:

Position – Site 4	123° 38' 13.4" W 48° 47' 21.0" N
Position - Site 5	123° 38' 11.9" W 48° 47' 22.3" N
Distance	49.7 m
True Course	36.8°

Total length of trail system = **354 m**



BRITISH COLUMBIA

Mt. Tzuhalem BRIM 2006

Legend

(20K) Transportation - Lines

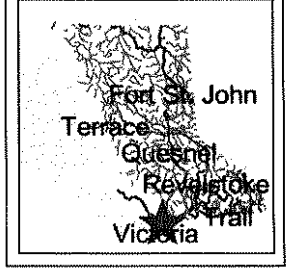
- Road (Paved Divided) - Not Elevated - 2 Lanes Each Way
- Road (Paved Divided) - U C - Not Elevated - 2 Lanes Each Way
- Road (Paved Undivided) Not Elevated - 3 Lanes
- Road (Paved Undivided) Not Elevated - More Than 4 Lanes
- Road (Paved Undivided) - U C - Not Elevated - 4 Lanes
- Airfield
- Airport
- Airstrip
- Airport Abandoned
- Ferry Route
- Road
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes
- Road (Gravel Undivided) - U C - 1 Lane
- Road (Gravel Undivided) - U C - 2 Lanes
- Road (Paved Divided) - Not Elevated - 1 Lane Each Way
- Road (Paved Divided) - U C - Not Elevated - 1 Lane Each Way
- Road (Paved Undivided) - Not Elevated - 2 Lanes

0 70 140 m.

Scale: 1:5,089

Datum/Projection: NAD83, Albers Equal Area Conic

Key Map of British Columbia



Mt. Tzuhalem Ecological Reserve

BCParks

RECREATIONAL & ECOLOGICAL IMPACT MONITORING **RMOT 202 Project**

Evaluators (Names) Max McDonald
Drew Milne
Shaun Tadei

Evaluation Date Oct 6th/05

Site Number: 1 **Site Identity Code:** **MTER-** 001

NTS MAP # 092B13 GPS **READING:** N-48° 47.284' W-123° 38.106'

SITE LOCATION DESCRIPTION: Describe in relation to permanent landmarks (using distances in m; compass direction on 360° scale)

Kiosque used as benchmark. Kiosque is off of the main trail. Grassy area to the N/NE of the kiosque. 3 Trails braiding off of the main trail

SITE DIAGRAM: Describe the trail camera point (A) as follows and use radial measurements from this point to prepare a sketch map of site on graph paper (provide scale and simple legend). Include the approximate distribution of impacts, photo points & x-section locations. See example sketch provided.

TRAIL CAMERA POINT: Name/describe if a permanent feature; measure in by distances and compass directions from nearby fix points. If necessary, mark centre point with iron pin or large nail (pound in flush with ground to prevent injury to site users).

For camera point A position using reference point see Site Diagram A

Benchmark / camera point B is the South support post of the information Kiosque Pin Installed? [N]

Site Identity Code: MTER- 001

B) TRAIL PROFILE (X-Section)

A PROFILE DIAGRAM: Stretch measuring tape horizontally from trail edge to trail edge at a right angle to the trail forming a baseline **(for this project the elevation of the tape will be original ground on each trail edge)**. Then take vertical measurements with another measuring tape/stick down to the trail surface at specific, recorded points along the measuring tape. Enter measurements below, or in the same fashion on a separate sheet. This will enable you to draw the trail profile on graph paper. (see similar example below). For trails contouring steep terrain it may be more accurate to stretch the tape sloping from bank to bank. In this case the tape's slope must be measured and recorded to enable a proper drawing.

- **Measure horizontal distances from left trail edge to right trail edge when facing the x-section from the trail camera point.**
- **Sketch x-section locations on the site diagram (use symbol with: section number, trail camera point and distance from it)**
- **All x-section measurements in centimetres**

X-section Number 1 (main trail) measurements started @ 10m S of camera pt. 1 see photo #02

horizontal	1.12	0.90	1.00	1.90	3.90	1.52	1.20	1.47	1.73	1.91	2.70	
vertical												

4.0m increments

X-section Number 2 (main trail to fence) measurements started @ fence 2.0m increments

horizontal	0.90	0.85	0.92	1.82	1.55							
vertical												

East to main trail.

X-section Number 3 (New trail) measurements from main trail to old logging road 2.0m increments

horizontal	1.20	0.70	0.45	0.40	0.50	0.50	0.40	0.50	0.30	0.50		
vertical												

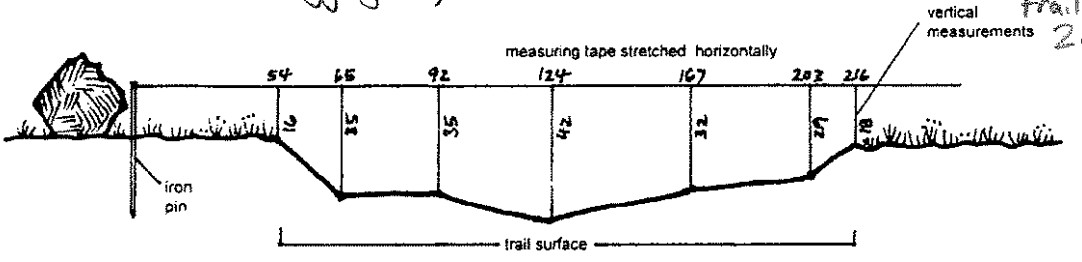
X-section Number 4 (slight trail) measurements from main trail to Old logging road 2.0m increments

horizontal	1.40	3.60	2.90	2.60	3.50	6.00						
vertical												

horizontal	1.40	1.70	1.70	1.60	3.20	3.40	1.50	0.90	2.00	1.70		

X section Number 5 (old logging road). measurement from main trail East to new trail junction 2.0m increments.

Example of drawing



Description of Trail Profile Sampling Site: (fill in / check applicable boxes):

Kind of vegetation the trail traverses [Garry Oak, arbutus, snowberry, nootka rose, douglas fir

Trail Gradient: X-Section Number_____ steep [ ] moderate grade [ ] gentle grade [ ] flat [ ]

X-Section Number_____ steep [ ] moderate grade [ ] gentle grade [ ] flat [ ]

X-Section Number_____ steep [ ] moderate grade [ ] gentle grade [ ] flat [ ]

X-Section Number_____ steep [ ] moderate grade [ ] gentle grade [ ] flat [ ]

Constructed trail [ ] Trail worn into natural materials [✓]

Trail used by: hikers [✓] horses [ ] mountain bikes [ ]

Water on trail: always [ ] during wet weather [✓] during snow melt [ ]

Active erosion taking place [ ] Trampling / vegetation wear along trail edges [✓]

Trail surface material (check several if mixed): gravel/stones [✓] sand [ ] loam [ ] clay [ ] forest litter [✓] organic "muck" [ ]
vegetation [✓] bedrock [ ]

Site Identity Code: MTER- 001

C) TRAIL SECTION IMPACT DESCRIPTION

The purpose of this analysis is to obtain an overall description of trail conditions that may be compared to a previous or subsequent description in the same terms. Select an entire trail, or a **section of this trail** with well-defined start and end points and estimate the portions (%) in the selected length that have specific impacts as described in the boxes on **Form: Trails p.3 of 3** . Select a trail section that traverses only one kind of vegetation, i.e. either forest, grassland, alpine tundra, etc.

NOTE:

- **For this project each group will use the trail section at the location of their plot site. The limits of each trail section is to be 10 metres in all trail directions from the trail camera point and trail profiles (x-sections) are to be located at a representative locations within this distance.**
- **For percentages of impact he total length of trail in each plot site will vary between 20, 30, or 40 meters (depending on the number of 10 meter legs from the trail camera point).**

GENERAL DESCRIPTION OF TRAIL SECTION
(include description of any items that will not change as a result of impacts)

This section of trail has not been heavily impacted there is moderate trail braiding adjacent to the main trail. There are a number of trees (garry oak, and douglas fir) that will remain as permanent fixtures as well as the kiosque at the fenced portion of the ER. The trail and associated braided trails are of a very gentle grade.

Use/impact is by

Hikers [✓]
Horses [ ]
Mountain bikes [ ]
Other Describe [ ]

Site Identity Code: MTER- 001

TRAILS (p.3 of 3)

First: Calculate and fill in how many meters of the chosen trail section would constitute 2, 3, and 5% (e.g. 2% of a 1 km trail section = 1000x(2/100) = 20 m. Then assess impact by circling a number (0 - 5) for each row within each kind of impact.

Item Wgt.	Indicator	N/A or 0	< 2% (=<.....m)	3-5% (=....-....m)	> 5% (=>....m)	Score	Previous Assess-ment's Score ( )	New Score x Wgt.

(Do not use weighting option (first and last column in initial field assessment)

1. TRAIL BRAIDING AND/OR WIDENING: This is the development of one or more trails alongside, and in addition to, the defined or established trail. **Slight** = 1 additional trail / double width; **Moderate** = 2 add. tr. / triple wi.; **Severe** = > 3 add. tr. / quadruple wi.

1 2 3	slight braiding of trail	0	1	2	3	(sum)		
	moderate braiding of trail	0	2	3	4			
	severe braiding of trail	0	3	4	5			

2. TRAIL "MUCKING": The formation of muddy sections with or without 'mudholes' and/or standing water (usually occurs on flat ground, with organic soils and/or on clay).

1 2 3	slight mucking	(0)	1	2	3	(sum)		
	moderate mucking	(0)	2	3	4			
	severe mucking	(0)	3	4	5			

3. TRAIL DEEPENING: The down-cutting of the trail into the soil, initially by compaction, then by erosion of the soil. **Slight** = 5 cm or less; **Moderate** = 6 - 30 cm; **Severe** = > 30 cm (Note: A trail tread that is cut only through the vegetation layer scores 0.)

1 2 3	slight deepening	0	1	2	3	(sum)		
	moderate deepening/erosion	0	2	3	4			
	severe deepening/erosion	0	3	4	5			

4. ROOT EXPOSURE: Applicable to forested trail sections. **Slight** = upper layer of roots (closest to soil surface) beginning to show; **Moderate** = upper layer of roots completely exposed; **Severe** = upper layer of roots and layer below both exposed, some parts of roots not supported by soil any more.

1 2 3	slight root exposure	(0)	1	2	3	(sum)		
	moderate root exposure	(0)	2	3	4			
	severe root exposure	(0)	3	4	5			

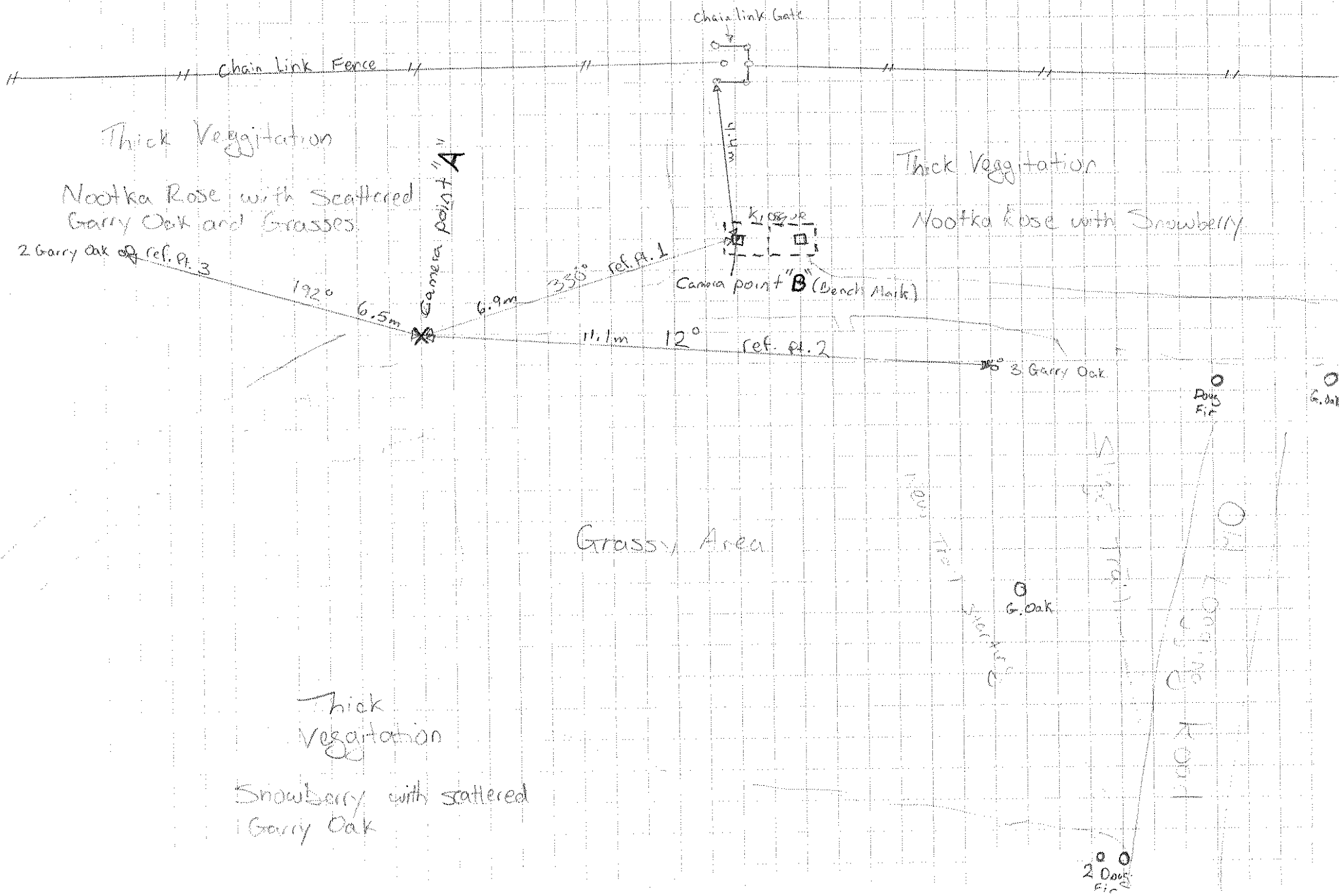
(5.) KIND OF TRAIL SURFACE: This section is mainly to monitor changes on new (unimproved) trails which are just forming (have just formed) on vegetated surfaces, e.g. through alpine turf, grasslands, wetlands (first box) and forest (second box).
Use upper box if the forest has a continuous cover of ground vegetation (e.g. kinnickinnik, pinegrass); use lower box if the forest floor is mainly covered with organic litter (e.g. needles, twigs). NOTE: RATING APPLIES TO THE ENTIRE TRAIL (SECTION)

	trails through low, continuous vegetation	0	1 - veget. worn, but still there	2- worn to dark surface soil	3- worn to lighter c. minerals.	(1 to 3)	2	
	trails under a tree canopy; no continuous ground vegetation	0	1- some wear on litter	2- worn to dark surface soil	3- worn to lighter c. minerals.	(1 to 3)		

6. OTHER IMPACTS: Name other impacts and classify into (1) slight, (2) moderate, or (3) severe. Or give verbal, qualitative description.

	description		slight	moderate	severe			
	N/A							

Site Diagram
"A"



Site Diagram 13