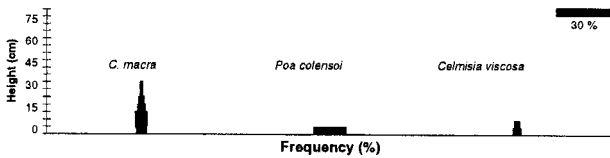


# Appendix 4

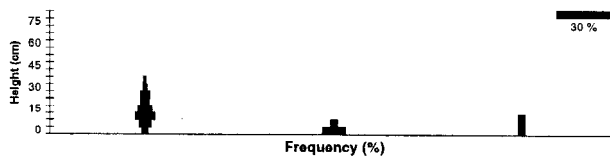
## HEIGHT FREQUENCY DATA

### Control Transect 4

1997



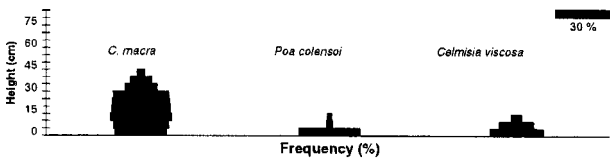
2000



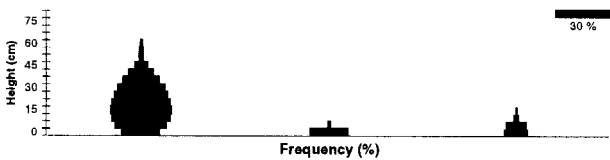
Transect 4C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 8

1997



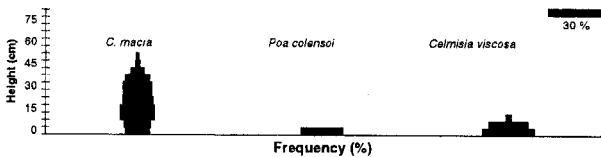
2000



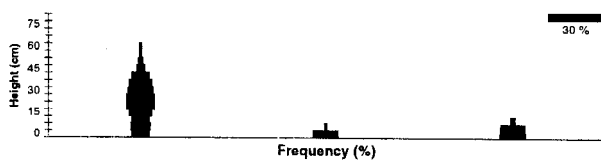
Transect 8C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 9

1997



2000

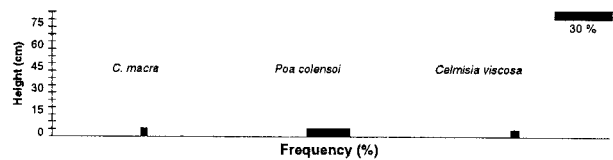


Transect 9C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

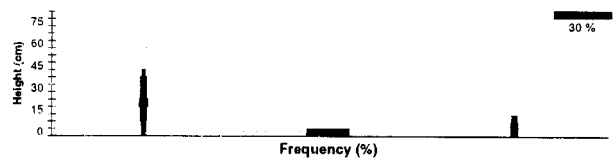
### Control Transect 13

1997

INCOMPLETE DATA



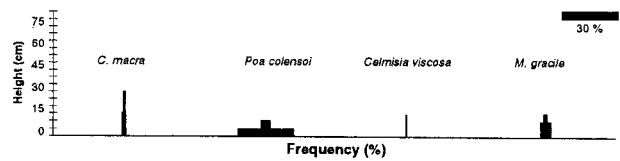
2000



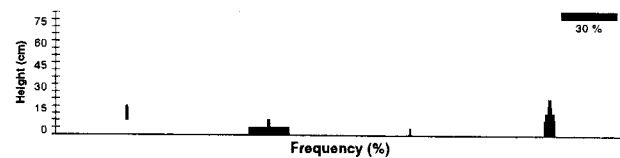
Transect 13C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 20

1997



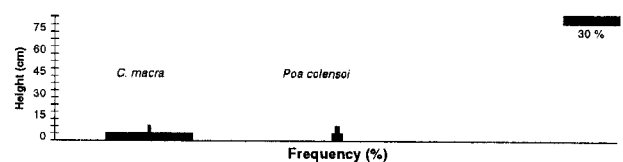
2000



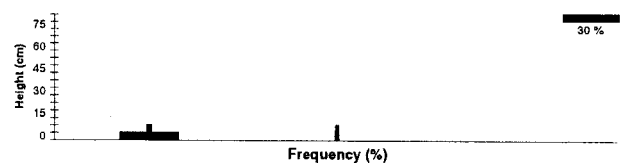
Transect 20C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 21

1997



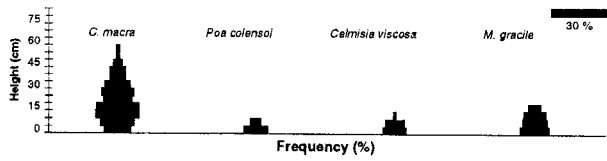
2000



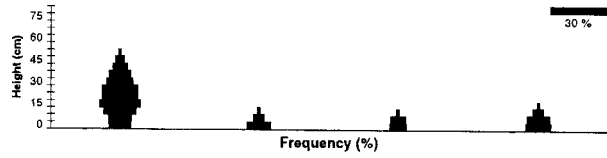
Transect 21C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 33

1997



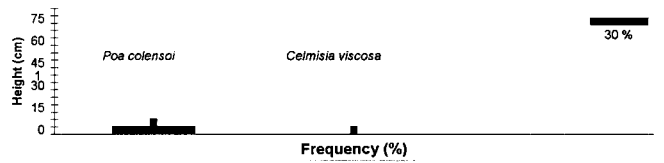
2000



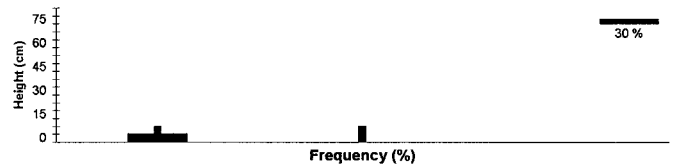
Transect 33C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 44

1997



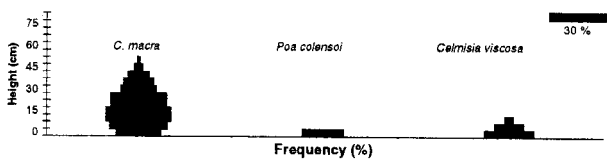
2000



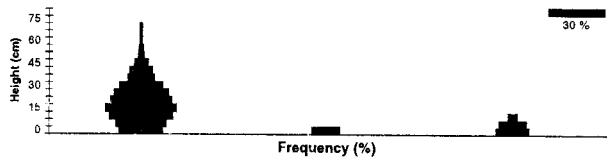
Transect 44C: Height-frequency values for the selected taller species on Transect in 1997 and 2000

### Control Transect 43

1997



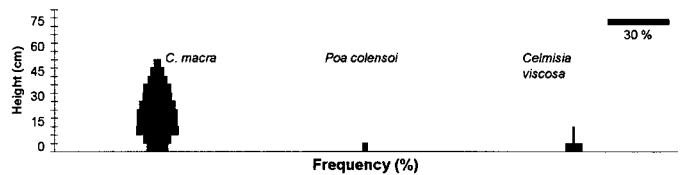
2000



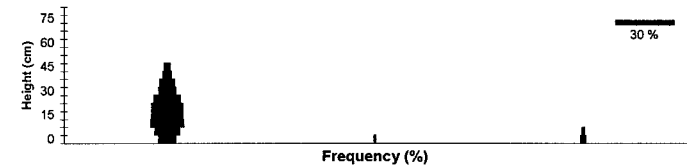
Transect 43C: Height-frequency values for selected taller species on the Transect in 1997 and 2000

### Control Transect 47

1997



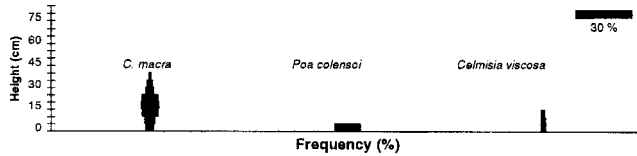
2000



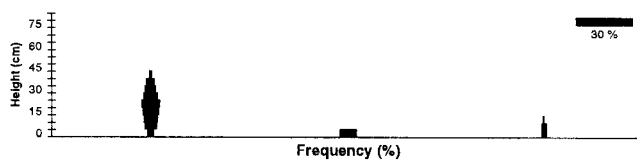
Transect 47C: Height-frequency values for the selected taller species on Transect in 1997 and 2000

### Groomed Transect 10

1997



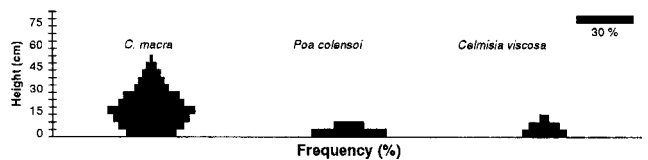
2000



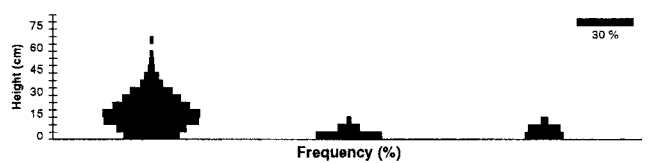
Transect 10G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 30

1997



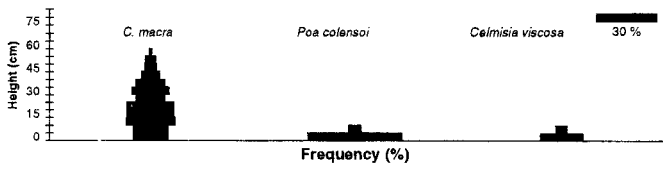
2000



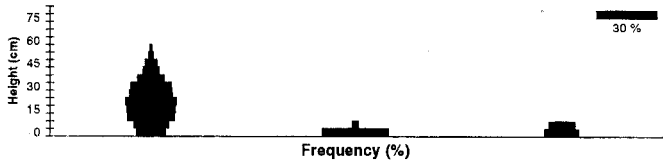
Transect 30G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 31

1997



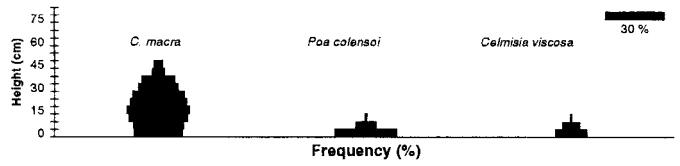
2000



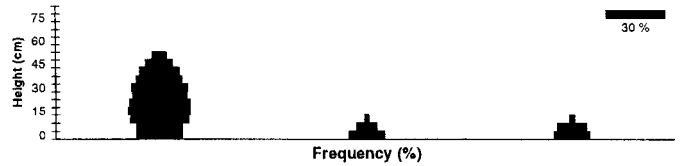
Transect 31G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 39

1997



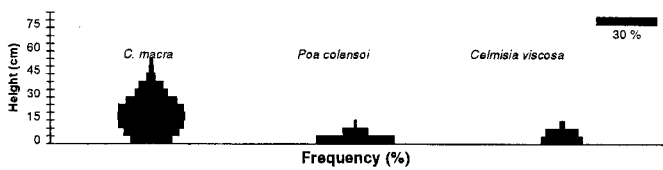
2000



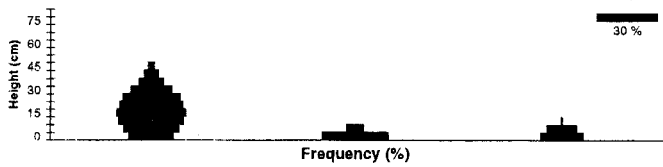
Transect 39G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 32

1997



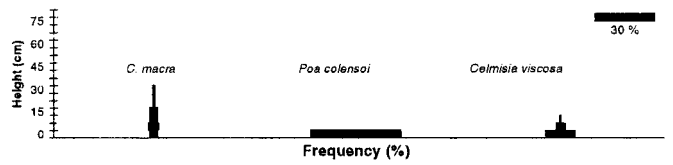
2000



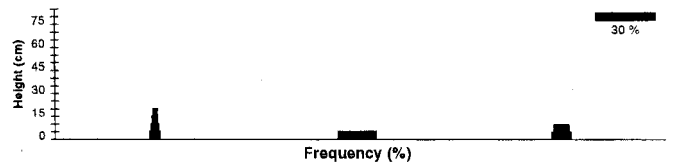
Transect 32G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 41

1997



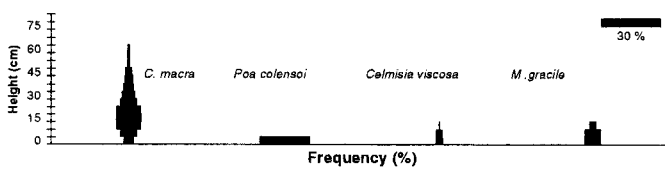
2000



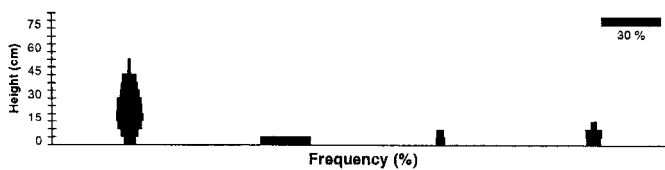
Transect 41G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 38

1997



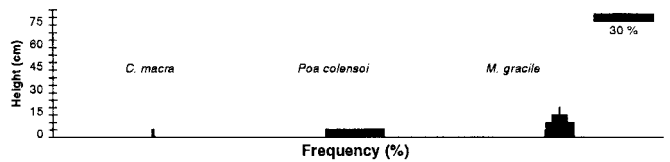
2000



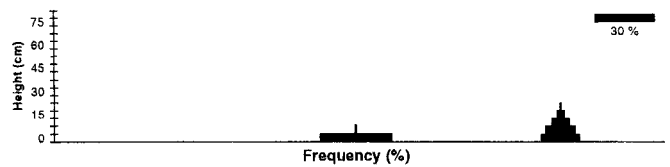
Transect 38G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 45

1997



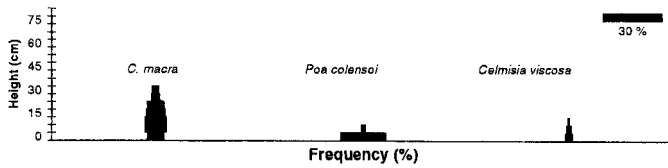
2000



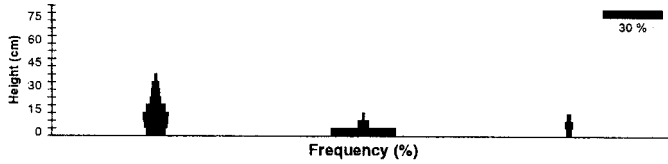
Transect 45G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 46

1997



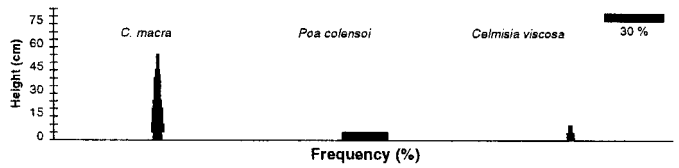
2000



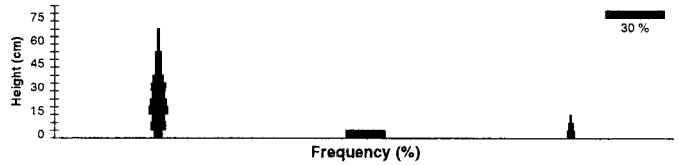
Transect 46G: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Groomed Transect 49

1997



2000

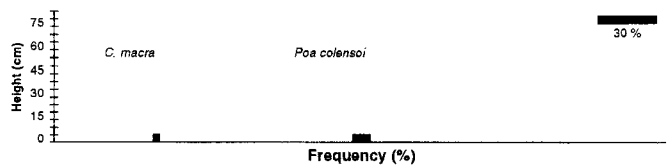


Transect 49G: Height-frequency values for selected taller species on Transect in 1997 and 2000

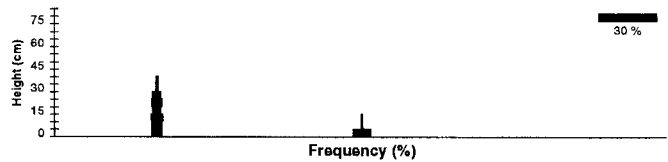
### Skied Transect 12

1997

INCOMPLETE DATA



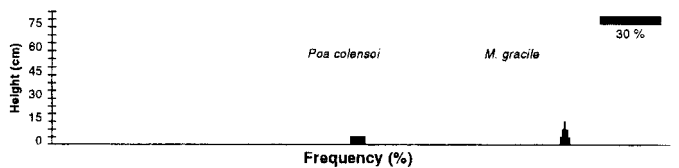
2000



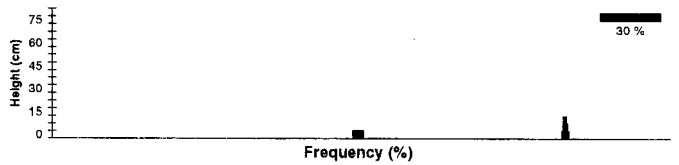
Transect 12S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 29

1997



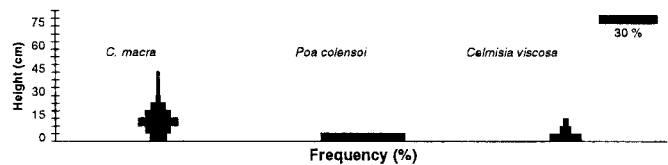
2000



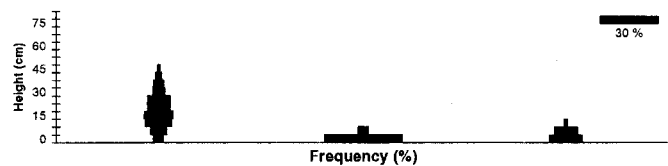
Transect 29S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 26

1997



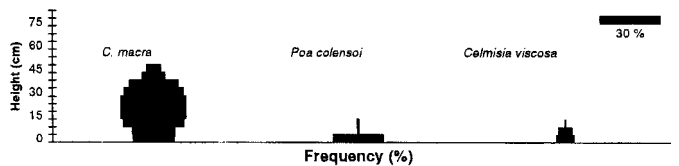
2000



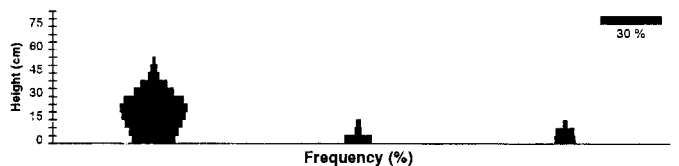
Transect 26S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 34

1997

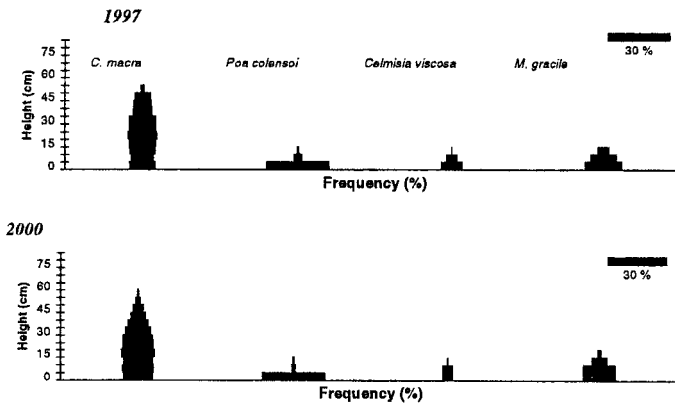


2000



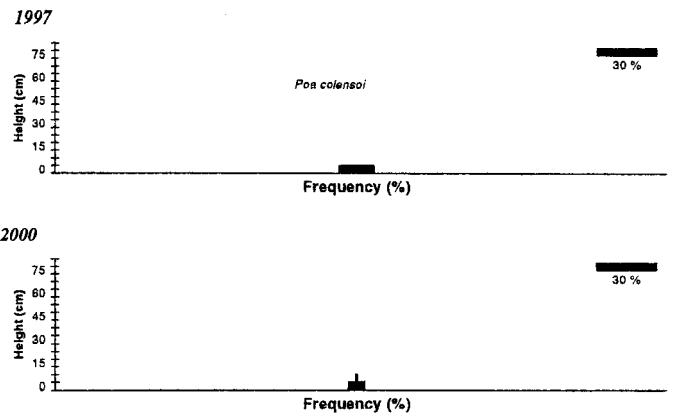
Transect 34S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 35



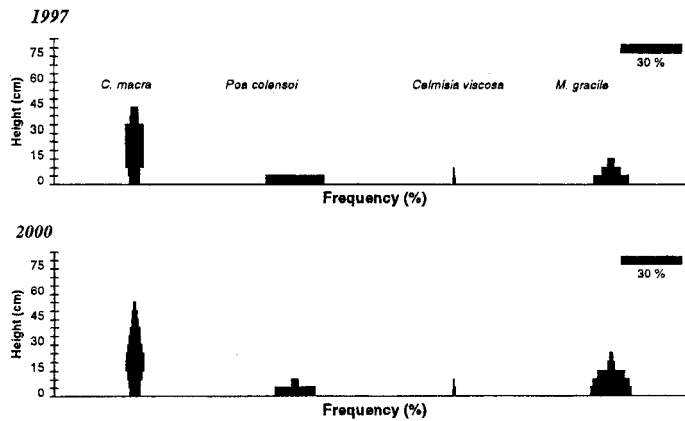
Transect 35S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 42



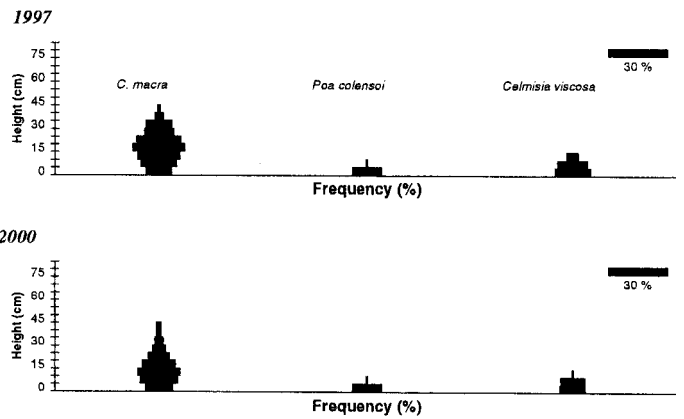
Transect 42S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 37



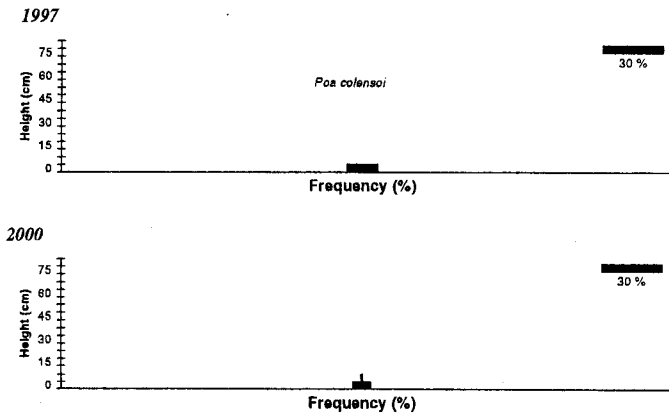
Transect 37S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 48



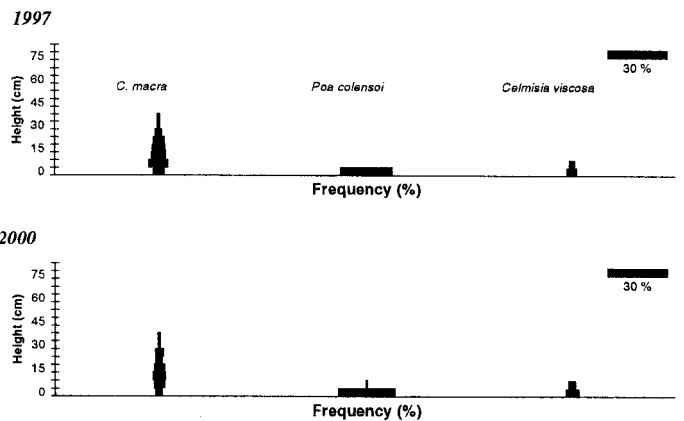
Transect 48S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 40



Transect 40S: Height-frequency values for selected taller species on Transect in 1997 and 2000

### Skied Transect 50



Transect 50S: Height-frequency values for selected taller species on Transect in 1997 and 2000

# Appendix 5

## PERCENTAGE GROUND COVER DATA

|                              |            |            |            |            |            |            |            |            |            |            |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Groom + ski transects</b> | <b>10G</b> | <b>31G</b> | <b>32G</b> | <b>38G</b> | <b>39G</b> | <b>41G</b> | <b>45G</b> | <b>46G</b> | <b>49G</b> |            |
| Dead vegetation & litter     | 31         | 38         | 50         | 23         | 28         | 28         | 15         | 31         | 26         |            |
| Live vegetation              | 36         | 34         | 24         | 33         | 44         | 31         | 31         | 29         | 30         |            |
| Lichen                       | 5          | 8          | 9          | 17         | 4          | 24         | 12         | 10         | 30         |            |
| Bare ground & filmy lichen   | 24         | 11         | 11         | 12         | 17         | 8          | 13         | 20         | 9          |            |
| Moss                         | 2          | 8          | 5          | 11         | 3          | 10         | 13         | 5          | 2          |            |
| Rock & bare gravel           | 2          | 0          | 1          | 4          | 3          | -          | 16         | 6          | 4          |            |
| <b>Ski transects</b>         | <b>12S</b> | <b>26S</b> | <b>29S</b> | <b>34S</b> | <b>35S</b> | <b>37S</b> | <b>40S</b> | <b>42S</b> | <b>48S</b> | <b>50S</b> |
| Dead vegetation & litter     | 26         | 32         | 27         | 44         | 38         | 27         | 34         | 26         | 31         | 31         |
| Live vegetation              | 42         | 33         | 39         | 35         | 32         | 42         | 42         | 43         | 33         | 37         |
| Lichen                       | 9          | 17         | 20         | 8          | 13         | 11         | 10         | 9          | 19         | 11         |
| Bare ground & filmy lichen   | 14         | 5          | 6          | 7          | 6          | 9          | 7          | 9          | 12         | 15         |
| Moss                         | 3          | 10         | 2          | 4          | 5          | 7          | 2          | 4          | 3          | 5          |
| Rock & bare gravel           | 6          | 3          | 6          | 3          | 6          | 4          | 5          | 9          | 2          | 2          |
| <b>Control transects</b>     | <b>4C</b>  | <b>8C</b>  | <b>9C</b>  | <b>13C</b> | <b>20C</b> | <b>21C</b> | <b>33C</b> | <b>43C</b> | <b>44C</b> | <b>47C</b> |
| Dead vegetation & litter     | 28         | 21         | 27         | 20         | 24         | 17         | 36         | 30         | 20         | 29         |
| Live vegetation              | 48         | 54         | 43         | 44         | 39         | 32         | 36         | 36         | 36         | 38         |
| Lichen                       | 8          | 9          | 25         | 19         | 26         | 19         | 13         | 9          | 28         | 18         |
| Bare ground & filmy lichen   | 10         | 4          | 1          | 9          | 7          | 11         | 8          | 18         | 7          | 10         |
| Moss                         | 2          | 6          | 5          | 3          | 3          | 10         | 2          | 5          | 4          | 4          |
| Rock & bare gravel           | 4          | 5          | 0          | 5          | 1          | 10         | 2          | 5          | 4          | 4          |

## Appendix 6. Photographic record



Figure A6.1. Relatively undisturbed cushionfield vegetation along a section of transect 4 (control) in 1997 (upper) and 2000 (lower).





Figure A6.2. An undisturbed cushionfield (transect 44) (upper, 1997; lower, 2000). Note the dead cushion plants and the presence of lichen on the surface of cushion plants as well as above ground.





Figure A6.3. Cushionfield at transect 34, which has been groomed since 1989. Little change in appearance between (upper) 1997 and (lower) 2000. Note that the condition of cushion plants and lichens appears to be good in the hollows.





Figure A6.4. (left) Damage to cushionfield vegetation in 1996 after 1 year's grooming. (right) After 4 years of grooming, little further damage is evident (transect 46).



Figure A6.5. (left) Damage to cushion plants 1 year after skiing commenced. (right) Level of damage has increased between 1997 and 2000, as areas of dead vegetation have broken off forming *Dracophyllum* litter (transect 50).



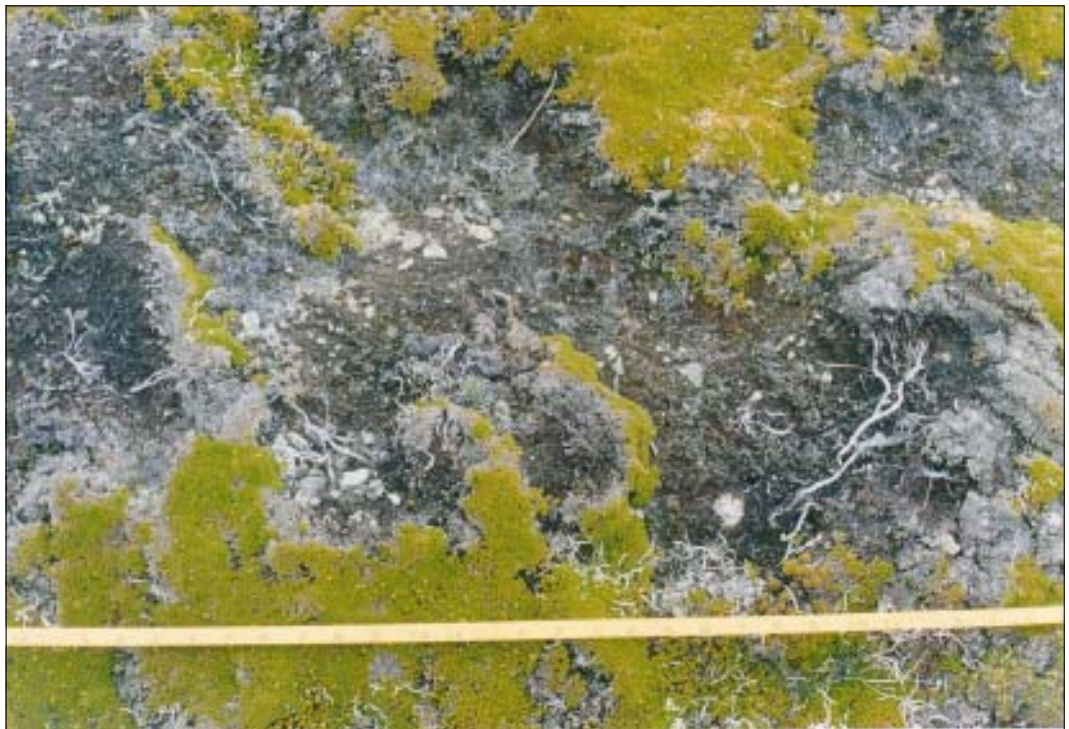


Figure A6.6. (upper) Damage to cushion vegetation after 20 years of skiing (1997). (lower) In 2000, the exposed bare ground is being colonised by moss and filmy lichens (transect 12).





Figure A6.7. (upper) Damage to cushion vegetation in 1997 after 1 year of grooming.  
(lower) By 2000, some of the *Dracophyllum muscoides* litter present has gone (transect 49).





Figure A6.8. (upper) Damage to cushion vegetation after 20 years of grooming (1997). (lower) By 2000, the exposed bare ground is being colonised by moss (transect 10).





Figure A6.9. (upper) Severe damage to *Celmisia viscosa* matfield on a steep slope near Tim's Table as a result of groomer use in 1997 and 2000. The extent of damage has increased. (lower) A new area of damage since 1997. Severe damage to cushion vegetation on a steep slope near Tim's Table has exposed soil to frost heaving from needle ice, with very little cushion vegetation still present (2000).