## Multiple–use forestry in the Nordic countries

Marjatta Hytönen (ed.)

1995

METLA, The Finnish Forest Research Institute

| C  | ontents                                                                                                                                                                                                                                                          | 3                           |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Fe | oreword                                                                                                                                                                                                                                                          | 7                           |
| 1  | Introduction                                                                                                                                                                                                                                                     | 9                           |
| 2  | A short history of forest uses<br>Bo Fritzbøger & Poul Søndergaard                                                                                                                                                                                               | 11                          |
|    | <ul> <li>2.1 Introduction</li> <li>2.2 Traditional multiple-use forestry</li> <li>2.3 Forestry, forest policies and woodland development</li> <li>2.4 The advent of sustained yield forestry</li> <li>2.5 Forests for leisure and modern multiplicity</li> </ul> | 12<br>15<br>27<br>33<br>36  |
| 3  | <b>History, evolution and significance of the multiple–use concept.</b> . <i>Marjatta Hytönen</i>                                                                                                                                                                | 43                          |
|    | <ul> <li>3.1 Too abstract to be useful?</li> <li>3.2 Origins of the concept</li> <li>3.3 Nordic countries</li> <li>3.4 Sustainable multiple-use forestry</li> </ul>                                                                                              | 44<br>44<br>46<br>59        |
| 4  | <b>Multiple–use forestry – a concept of communication</b>                                                                                                                                                                                                        | 67                          |
|    | <ul> <li>4.1 Introduction</li></ul>                                                                                                                                                                                                                              | 68<br>69<br>72<br>75<br>77  |
| 5  | Timber production and the forest industry         Marjatta Hytönen & Sigurdur Blöndal                                                                                                                                                                            | 81                          |
|    | <ul> <li>5.1 Introduction .</li> <li>5.2 Timber resources .</li> <li>5.3 Silviculture .</li> <li>5.4 Forest industry .</li> <li>5.5 Future challenges .</li> </ul>                                                                                               | 82<br>82<br>91<br>96<br>103 |
| 6  | <b>Non–timber forest products and their utilization</b><br><i>Kauko Salo</i>                                                                                                                                                                                     | 117                         |
|    | <ul> <li>6.1 An aspect of multiple–use forestry</li> <li>6.2 Rights of public access.</li> <li>6.3 Occurrence of wild berries in the Nordic countries.</li> <li>6.4 Yields of the most important wild berries</li> </ul>                                         | 118<br>118<br>121<br>127    |

|    | 6.5                                   | Edible mushroom species in the Nordic countries | 134 |  |
|----|---------------------------------------|-------------------------------------------------|-----|--|
|    | 6.6                                   | Mushroom yields                                 | 139 |  |
|    | 6.7                                   | Other forest products.                          | 144 |  |
| 7  | <b>Reindeer husbandry and hunting</b> |                                                 |     |  |
|    | 7.1                                   | Introduction.                                   | 158 |  |
|    | 7.2                                   | Reindeer husbandry                              | 158 |  |
|    | 7.3                                   | Hunting                                         | 170 |  |
|    | 7.4                                   | Reindeer and game in forest planning            | 179 |  |
| 8  | Fauna                                 | and flora management in forestry                | 191 |  |
|    | Kjell S                               | Sjöberg & Tommy Lennartsson                     |     |  |
|    | 8.1                                   | Introduction.                                   | 192 |  |
|    | 8.2                                   | Basic concepts.                                 | 198 |  |
|    | 8.3                                   | How forestry influences biodiversity            | 206 |  |
|    | 8.4                                   | Strategies for maintaining biodiversity         | 215 |  |
|    | 8.5                                   | Tools for maintaining biodiversity              | 216 |  |
|    | 8.6                                   | Who should act?                                 | 227 |  |
|    | 8.7                                   | The future                                      | 228 |  |
| 9  | Forest                                | t recreation                                    | 245 |  |
|    | Frank                                 | Søndergaard Jensen                              |     |  |
|    | 9.1                                   | Introduction.                                   | 246 |  |
|    | 9.2                                   | Recreational use of the forest                  | 247 |  |
|    | 9.3                                   | Preferences of the population                   | 258 |  |
|    | 9.4                                   | Nature interpretation and nature schools        | 261 |  |
|    | 9.5                                   | Urban forests and green spaces                  | 267 |  |
|    | 9.6                                   | Future                                          | 269 |  |
| 10 |                                       | t aesthetics                                    | 279 |  |
|    | 10.1                                  | Introduction.                                   | 280 |  |
|    | 10.2                                  | Cultural importance of forest aesthetics        | 280 |  |
|    | 10.3                                  | Perception of forest stands                     | 281 |  |
|    | 10.4                                  | Combinations of forest stands                   | 283 |  |
|    | 10.5                                  | Design and management of visual variation       | 286 |  |
|    | 10.6                                  | Forest and the landscape                        | 288 |  |
|    | 10.7                                  | Discussion and concluding remarks               | 289 |  |

x

| 11 | Lands            | cape management in forestry                             | 295 |  |  |  |
|----|------------------|---------------------------------------------------------|-----|--|--|--|
|    | Minna Komulainen |                                                         |     |  |  |  |
|    | 11.1             | Introduction                                            | 296 |  |  |  |
|    | 11.2             | Forest aesthetics                                       | 296 |  |  |  |
|    | 11.3             | History of forest aesthetics.                           | 297 |  |  |  |
|    | 11.4             | Foresters as managers of nature and landscape 1880–1950 | 300 |  |  |  |
|    | 11.5             | Functional aesthetics and efficient forest management   |     |  |  |  |
|    |                  | 1950–1970                                               | 302 |  |  |  |
|    | 11.6             | Ecological trends in landscape management in the 1980s  | 305 |  |  |  |
|    | 11.7             | Research on forest landscape planning                   | 308 |  |  |  |
|    | 11.8             | Future aesthetic trends in multi-value forestry         | 313 |  |  |  |
| 12 | Cultu            | ral heritage in multiple–use forestry                   | 321 |  |  |  |
|    |                  | e Højring                                               |     |  |  |  |
|    | 12.1             | Introduction                                            | 322 |  |  |  |
|    | 12.1             | Land conquest and heritage preservation.                | 323 |  |  |  |
|    | 12.2             | The forest as a heritage preserver                      | 324 |  |  |  |
|    | 12.5             | Forest management after the Second World War            | 324 |  |  |  |
|    | 12.5             | Protection of historical remains today                  | 326 |  |  |  |
|    | 12.6             | Protection of the surroundings                          | 326 |  |  |  |
|    | 12.7             | Unprotected remains                                     | 327 |  |  |  |
|    | 12.8             | The organizational context of heritage preservation     | 328 |  |  |  |
|    | 12.9             | Wood production and heritage preservation               | 330 |  |  |  |
|    | 12.10            | Altering perspectives                                   | 331 |  |  |  |
|    | 12.11            | A widening of the concept                               | 333 |  |  |  |
|    | 12.12            | Biological interests.                                   | 333 |  |  |  |
|    | 12.13            | Livestock husbandry                                     | 334 |  |  |  |
|    | 12.14            | Recreational exploitation of forest                     | 335 |  |  |  |
|    | 12.15            | "Nature" parks and ecomuseums                           | 336 |  |  |  |
|    | 12.16            | Conclusions                                             | 337 |  |  |  |
| 13 | Econd            | omic value of non-timber forest goods and services      | 343 |  |  |  |
|    |                  | Nov Johansson & Bengt Kriström & Leif Mattsson          |     |  |  |  |
|    | 13.1             | Introduction                                            | 344 |  |  |  |
|    | 13.2             | Hunting                                                 | 345 |  |  |  |
|    | 13.3             | Forest recreation.                                      | 348 |  |  |  |
|    | 13.4             | Fragile forests and endangered species                  | 349 |  |  |  |
|    | 13.5             | Methodological problems and discussion                  | 351 |  |  |  |

| 14 Multiple–use forestry administration, legislation and interest |          |                                                         |     |  |  |
|-------------------------------------------------------------------|----------|---------------------------------------------------------|-----|--|--|
|                                                                   | group    | 8                                                       | 357 |  |  |
| Katarina Eckerberg                                                |          |                                                         |     |  |  |
|                                                                   | 14.1     | Introduction.                                           | 358 |  |  |
|                                                                   | 14.2     | The four Nordic countries                               | 359 |  |  |
|                                                                   | 14.3     | Denmark                                                 | 363 |  |  |
|                                                                   | 14.4     | Norway                                                  | 368 |  |  |
|                                                                   | 14.5     | Finland                                                 | 373 |  |  |
|                                                                   | 14.6     | Sweden                                                  | 377 |  |  |
|                                                                   | 14.7     | Comparison and conclusions                              | 382 |  |  |
|                                                                   | 14.8     | Perspectives for the future                             | 385 |  |  |
| 15                                                                | Plann    | ing of multiple–use forestry                            | 391 |  |  |
|                                                                   |          | Kangas & Lene Kristiansen                               | 0,1 |  |  |
|                                                                   | 15.1     | Introduction.                                           | 202 |  |  |
|                                                                   | 15.1     | Planning facilitates decision-making                    |     |  |  |
|                                                                   | 15.2     | Some background to present approaches applied to forest | 572 |  |  |
|                                                                   | 19,5     | planning in the Nordic countries.                       | 395 |  |  |
|                                                                   | 15.4     | Attempts to develop multiple–use planning methods and   | 570 |  |  |
|                                                                   | 10.1     | systems in the Nordic countries                         | 400 |  |  |
|                                                                   | 15.5     | The perspectives of multiple–use planning.              | 411 |  |  |
| •                                                                 |          |                                                         |     |  |  |
| 16                                                                |          | ple–use research                                        | 417 |  |  |
|                                                                   |          | aastamoinen & Marjatta Hytönen                          |     |  |  |
|                                                                   | 16.1     | Introduction                                            | 418 |  |  |
|                                                                   | 16.2     | Denmark                                                 |     |  |  |
|                                                                   | 16.3     | Finland                                                 |     |  |  |
|                                                                   | 16.4     | Iceland                                                 |     |  |  |
|                                                                   | 16.5     | Norway                                                  |     |  |  |
|                                                                   | 16.6     | Sweden                                                  |     |  |  |
|                                                                   | 16.7     | Research for the future                                 | 438 |  |  |
| Μ                                                                 | ap of t  | he Nordic countries                                     | 447 |  |  |
| St                                                                | otistics | \$                                                      | 118 |  |  |
| 51                                                                | ausuva   | A. Area and population                                  | 770 |  |  |
|                                                                   |          | B. Structure of land use                                |     |  |  |
|                                                                   |          | C. Forest resources                                     |     |  |  |
|                                                                   |          | D. Tree species distribution                            |     |  |  |
|                                                                   |          | E. Productive forest area by owner groups               |     |  |  |
|                                                                   |          | F. Forest products in the economy                       |     |  |  |
| ~                                                                 |          |                                                         |     |  |  |
| Subject index 4                                                   |          |                                                         | 450 |  |  |