FFs 11 Kogelberg Sandstone Fynbos

VT 69 Macchia (98%) (Acocks 1953). Mesic Mountain Fynbos (81%) (Moll & Bossi 1983). LR 64 Mountain Fynbos (93%) (Low & Rebelo 1996). BHU 56 Kogelberg Mountain Fynbos Complex (63%), BHU 54 Franschhoek Mountain Fynbos Complex (32%) (Cowling et al. 1999b, Cowling & Heijnis 2001).

**Distribution** Western Cape Province: From Franschhoek, Groot-Drakensteinberge and Simonsberg (near Stellenbosch) in the north passing southwards between Gordon’s Bay and Bot River to Cape Hangklip and Kleinmond in the south including the Jonkershoek, Stellenbosch, Franschhoek, Groenland, Hottentots Holland, Kogelberg and Palmietberge Mountains. Altitude 20–1 590 m at summit of Somerset Sneeukop.

**Vegetation & Landscape Features** High mountains with steep to gentle slopes, and undulating plains and hills of varied aspect. General appearance of vegetation low, closed shrubland with scattered emergent tall shrubs. Proteoid, ericaceous and restioid fynbos dominate, while asteraceous fynbos is rare. Patches of Cape thicket are common in the northern areas; in the south similar habitats are occupied by scrub fynbos. Numerous seeps and seasonally saturated mountain-plateau wetlands (locally called ‘suurvlakte’) are very common and support restioid and ericaceous (dominated by Bruniaceae) fynbos.

**Geology & Soils** Acidic lithosol soils derived from Ordovician sandstones of the Table Mountain Group (Cape Supergroup). Deep sandy blankets (whitish, nutrient-poor acidic sand) develop in depressions and on slopes resisting erosion. Land types mainly Ic, Ib and Gb.

**Climate** MAP 670–3 000 mm (mean: 1 330 mm), peaking markedly May to August. This region has the highest recorded rainfall in the Cape (see Section 2.4.2 of this chapter). Mean daily maximum and minimum temperatures 24.0°C and 6.1°C for February and July, respectively. Frost incidence 2 or 3 days per year. The summit cloud (the ‘Hottentot’s Blanket’) is a regular feature in summer when the Southeaster (part of the global system of trade-winds) brings heavy mist precipitation to the summits and adjacent south-facing and east-facing slopes. See also climate diagram for FFs 11 Kogelberg Sandstone Fynbos (Figure 4.21).

**Important Taxa** (TCape thickets, WWetlands)Small Trees: *Brabejum stellatifolium*T (d), *Widdringtonia nodiflora* (d), *Heeria argentea*T, *Leucospermum conocarpodendron* subsp. *viridum*, *Metrosideros angustifolia*T, *Podocarpus elongatus*T, *Protea nitida*. Tall Shrubs: *Brunia albiflora*W (d), *Cliffortia cuneata* (d), *Diospyros glabra*T (d), *Leucadendron salicifolium* (d), *Liparia myrtifolia* (d), *Metalasia densa* (d), *Mimetes argenteus* (d), *Protea neriifolia* (d), *P. repens* (d), *Psoralea pinnata*W (d), *Aspalathus linearis*, *A. willdenowiana*, *Cunonia capensis*T, *Erica perspicua* var. *perspicua*W, *Euryops abrotanifolius*, *E. serra*, *Laurophyllus capensis*T, *Liparia rafnioides*, *Myrsine africana*T, *Pseudobaeckea africana*, *Psoralea aphylla*, *Rapanea melanophloeos*T, *Rhus tomentosa*T. Low Shrubs: *Agathosma ovata* (d), *A. serratifolia* (d), *Aulax cancellata* (d), *Berzelia lanuginosa*W (d), *B. squarrosa* (d), *Brunia alopecuroides*W (d), *Cliffortia graminea* (d), *C. hirsuta* (d), *C. pedunculata* (d), *C. polygonifolia* (d), *C. ruscifolia* (d), *Cullumia setosa* (d), *Diosma hirsuta* (d), *Erica coccinea* subsp. *coccinea* (d), *E. desmantha* (d), *E. equisetifolia* (d), *E. fastigiata* (d), *E. hispidula* (d), *E. imbricata* (d), *E. labialis* (d), *E. lutea* (d), *E. muscosa* (d), *E. parviflora*W (d), *E. pulchella* (d), *E. similis* (d), *E. viscaria* subsp. *longifolia* (d), *Euryops pinnatipartitus* (d), *Grubbia tomentosa* (d), *Leucadendron gandogeri* (d), *L. platyspermum* (d), *L. salignum* (d), *L. spissifolium* subsp. *spissifolium* (d), *L. xanthoconus* (d), *Leucospermum oleifolium* (d), *Mimetes cucullatus* (d), *Nebelia fragarioides* (d), *N. paleacea* (d), *N. sphaerocephala* (d), *Osmitopsis asteriscoides*W (d), *Otholobium obliquum* (d), *Penaea mucronata* (d), *Phaenocoma prolifera* (d), *Phylica anomala* (d), *Protea cynaroides* (d), *P. grandiceps* (d), *Retzia capen­sis* (d), *Roella ciliata* (d), *Saltera sarcocolla* (d)*, Serruria inconspicua* (d), *Stoebe incana* (d)*, S. plumosa* (d), *Syncarpha vestita* (d), *Ursinia paleacea* (d), *Amphithalea ericifolia* subsp. *scoparia*, *Anaxeton asperum*, *Anthospermum aethiopicum*, *A. galioides* subsp. *galioides*, *Aspalathus angustifolia* subsp. *angustifolia*, *A. aspalathoides*, *A. attenuata*, *A. bracteata*, *A. caledonensis*, *A. callosa*, *A. ciliaris*, *A. commutata*, *A. cordata*, *A. crenata*, *A. cytisoides*, *A. divaricata* subsp. *divaricata*, *A. divaricata* subsp. *gracilior*, *A. dunsdoniana*, *A. filicaulis*, *A. intervallaris*, *A. macrantha*, *A. marginata*, *A. oblongifolia*, *A. perfoliata* subsp. *perfoliata*, *A. perforata*, *A. pinea* subsp. *caudata*, *A. radiata* subsp. *radiata*, *A. ramulosa*, *A. stenophylla*, *A. tridentata* subsp. *tridentata*, *Asparagus lignosus*, *A. rubicundus*, *Berzelia abrotanoides*, *B. intermedia*, *Brunia laevis*, *B. nodiflora*, *Capelio tabularis*, *Cliffortia atrata*, *C. exilifolia*, *Clutia polygonoides*, *Diastella divaricata* subsp. *montana*, *Dolichothrix ericoides*, *Elytropappus gnaphaloides*, *Erica axillaris*, *E. benthamiana*, *E. corifolia*, *E. corydalis*, *E. curviflora*, *E. ericoides*, *E. exleeana*, *E. intervalla­ris*W, *E. massonii*, *E. odorata*, *E. petrophila*, *E. pilosiflora* subsp. *pilosiflora*, *E. plukenetii* subsp. *plukenetii*, *E. rigidula*, *E. serrata*, *E. sessiliflora*, *E. taxifolia*, *E. totta*, *E. transparens*, *E. ventricosa*, *Euryops rupestris* var. *dasycarpus*, *E. rupestris* var. *rupestris*, *Gnidia pinifolia*, *Halleria elliptica*, *Hermas villosa*, *Hippia pilosa*, *Indigofera glomerata*, *I. trita* subsp. *subulata*, *Klattia partita*, *Leucadendron laureolum*, *L. microcephalum, Linconia cuspidata*, *Liparia splendens*, *Lobelia pinifolia*, *Maytenus oleoides*T, *Metalasia brevifolia*, *M. cephalotes*, *M. erubescens*, *M. inversa*, *M. plicata*, *M. tenuifolia*, *Microdon dubius*, *Osteospermum cili­atum*, *Otholobium fruticans*, *Paranomus sceptrum-gustavianus*, *Passerina truncata* subsp. *monticola*, *Phylica lasiocarpa*, *Polygala pottebergensis*, *Prismatocarpus diffusus*, *P. schlechteri*, *Protea angustata*, *P. lorea*, *P. scabra*, *P. speciosa*, *Raspalia microphylla*, *Roella incurva*, *Serruria acrocarpa*, *S. flagellifolia*, *S. phylicoides*, *S. rostellaris*, *S. rubricaulis*, *Spatalla longifolia*, *S. propinqua*W, *S. racemosa*, *Teedia lucida*, *Thamnea uniflora*, *Ursinia pinnata*, *U. quinquepartita*W, *Zyrphelis foliosa*, *Z. lasiocarpa*, *Z. taxifolia*. Succulent Shrubs: *Othonna quinquedentata* (d), *Crassula coccinea*, *Oscularia deltoides*. Semiparasitic Shrubs: *Thesium carinatum*, *T. ericaefolium*. Pseudocarnivorous Shrub: *Roridula gorgonias*. Herbs: *Arctotis semipapposa* (d), *Carpacoce spermacocea*, *Centella difformis*, *C. eriantha*, *C. virgata*, *Chironia decumbens*, *Corymbium congestum*, *C. glabrum*, *Edmondia sesamoides*, *Helichrysum litorale*, *Nemesia acuminata*, *Pseudoselago serrata*, *Ursinia nudicaulis*, *U. oreogena*, *Villarsia capensis*W. Geophytic Herbs: *Blechnum punctulatum* (d), *Lanaria lanata* (d), *Pteridium aquilinum* (d), *Schizaea pectinata* (d), *Watsonia borbonica* subsp. *borbonica* (d), *Agapanthus africanus*, *Aristea africana*, *A. capitata*, *Blechnum capense*, *Bobartia indica*, *Bulbinella nutans* subsp. *turfosicola*W, *Disa pillansii*W, *Eriospermum bakerianum* subsp. *bakerianum*, *Geissorhiza aspera*, *G. burchellii*, *G. cataractarum*W, *G. hesperanthoides*, *G. hispidula*, *G. intermedia*, *G. nubigena*, *G. ovata*, *G. parva*, *G. ramosa*, *G. schinzii*, *G. similis*, *G. umbrosa*, *Romulea flava*, *R. gracillima*, *R. schlechteri*W, *Rumohra adiantiformis*, *Trachyandra tabularis*, *Wachendorfia thyrsiflora*W. Succulent Herb: *Crassula pellucida* subsp. *pellucida*. Carnivorous Herb: *Drosera glabripes*W. Graminoids: *Anthochortus crinalis* (d), *A. graminifolius* (d), *Askidiosperma paniculatum* (d), *Calopsis paniculata* (d), *Cannomois parviflora* (d), *C. virgata* (d), *Ceratocaryum argenteum* (d), *Cymbopogon marginatus* (d), *Elegia capensis*W (d), *E. deusta* (d), *E. ebracteata* (d), *E. filacea* (d), *E. grandis*W (d), *E. hookeriana* (d), *E. juncea* (d), *E. racemosa* (d), *E. spathacea* (d), *E. mucronata* (d), *E. thyrsifera* (d), *Hypodiscus albo-aristatus* (d), *H. aristatus* (d), *Ischyrolepis capensis* (d), *I. sieberi* (d), *I. tenuissima* (d), *Mastersiella digitata* (d), *Merxmuellera stricta* (d), *Nevillea obtusissima* (d), *Pentameris macrocalycina* (d), *Pentaschistis colorata* (d), *Restio bifidus* (d), *R. egregius* (d), *R. filiformis* (d), *R. perplexus* (d), *R. purpurascens* (d), *R. similis* (d), *Staberoha aemula* (d), *S. cernua* (d), *Tetraria bromoides* (d), *T. capillacea* (d), *T. compar* (d), *T. fasciata* (d), *T. flexuosa* (d), *T. involucrata* (d), *T. thermalis* (d), *Thamnochortus gracilis* (d), *T. pulcher* (d), *Willdenowia glomerata* (d), *Calopsis hyalina*, *C. membranacea*, *Carpha glomerata*, *Chrysitrix capensis*, *Cyathocoma hexandra*W, *Ehrharta ramosa* subsp. *aphylla*, *Elegia stokoei*, *Epischoenus quadrangularis*, *Ficinia acuminata*, *F. albicans*, *F. ecklonea*, *F. trichodes*, *Hypodiscus willdenowia*, *Ischyrolepis gaudichaudiana*, *I. subverticillata*W, *Neesenbeckia punctoria*, *Pentaschistis curvifolia*, *Platycaulos cascadensis*W, *Restio ambiguus*, *R. dispar*, *R. occultus*, *R. triticeus*, *R. versatilis*, *Tetraria burmannii*, *T. ligulata*, *Willdenowia humilis*, *W. sulcata*.

**Endemic Taxa** (WWetlands)Small Tree: *Mimetes arboreus*. Tall Shrubs: *Protea stokoei* (d), *Aspalathus globosa*, *A. stokoei*, *Cliffortia heterophylla*, *Liparia calycina*, *Mimetes hottentoticus*, *Orothamnus zeyheri*W (small population also in FFs 12), *Podalyria cordata*. Low Shrubs: *Berzelia dregeana* (d), *Erica cristata* (d), *E. sitiens* (d), *Leucospermum bolusii* (d), *Spatalla setacea*W (d), *Ursinia caledonica*W (d), *Acmadenia candida*, *A. nivea*, *Adenandra multiflora*, *Agathosma rosmarinifolia*, *A. stokoei*, *Amphithalea bowiei*, *A. oppositifolia*, *A. stokoei*, *Anaxeton ellipticum*, *Aspalathus acanthiloba*, *A. concava*, *A. monosperma*, *A. salicifolia*, *A. vacciniifolia*, *Berzelia ecklonii*, *Brunia stokoei*, *Capelio caledonica*, *Cliffortia hermaphroditica*, *C. ovalis*, *C. viridis*, *Diastella fraterna*, *D. thymelaeoides* subsp. *meridiana*, *D. thymelaeoides* subsp. *thymelaeoides*, *Erica amphigena*, *E. atricha*, *E. banksii* subsp. *banksii*, *E. banksii* subsp. *comptonii*, *E. bibax*W, *E. cabernetea*, *E. campanularis*W, *E. ceraria*, *E. chiroptera*, *E. cincta*, *E. cunoniensis*, *E. cygnea*, *E. extrusa*, *E. foliacea*, *E. gysbertii*, *E. hameriana*, *E. hottentotica*W, *E. humidicola*W, *E. intonsa*, *E. jacksoniana*W, *E. kogelbergensis*, *E. krugeri*, *E. lananthera*, *E. latiflora*, *E. leucotrachela, E. lycopodiastrum*, *E. macroloma*, *E. magistrati*, *E. multiflexuosa*, *E. nana*, *E. notholeeana*, *E. oreophila*, *E. pageana*W, *E. perplexa*, *E. pillansii* subsp. *fervida*W, *E. pillansii* subsp. *pillansii*W, *E. pycnantha*, *E. retorta*, *E. ribisaria*, *E. salax*, *E. squarrosa*, *E. stokoeanthus*W, *E. stokoei*, *E. suffulta*, *E. thomae*, *E. truncata*, *E. tubercularis*, *E. vallis-aranearum*, *E. viridimontana* subsp. *nivicola*, *E. viridimontana* subsp. *viridimontana*, *E. viscaria* subsp. *gallorum*, *Euchaetis glabra*, *Euryops indecorus*, *Glischrocolla formosa*, *Grubbia rourkei*, *Heliophila ramosissima*, *Klattia flava*, *K. stokoei*, *Leucospermum cordatum*, *Liparia bonaespei*, *L. boucheri*, *Metalasia confusa*, *M. humilis*, *M. lichtensteinii*, *M. quinqueflora*, *Mimetes capitulatus*, *M. stokoei* (extinct in wild), *Muraltia aciphylla*, *M. aspalatha*, *M. asparagifolia*, *M. capensis*, *M. chamaepitys*, *M. guthriei*, *M. hyssopifolia*, *M. occidentalis*, *M. paludosa*, *M. pubescens*, *M. stokoei*, *M. vulpina*, *Nivenia concinna*, *N. levynsiae*, *N. stokoei*, *Osmitopsis glabra*, *O. parvifolia*, *Paranomus spicatus*, *Phylica guthriei*, *P. linifolia*, *P. variabilis*, *Prismatocarpus cordifolius*, *Rafnia racemosa* subsp. *pumila*, *Raspalia globosa*, *Senecio speciosissimum*W, *Serruria deluvialis*, *Sonderothamnus petraeus*, *Sorocephalus clavigerus*, *S. palustris*W, *S. tenuifolius*, *Spatalla mollis*W, *S. prolifera*W, *Staavia brownii*, *Stylapterus barbatus*, *S. micranthus*, *Syncarpha lepidopodium*, *Thaminophyllum multiflorum, Ursinia eckloniana*W. Succulent Shrubs: *Lampranthus middlemostii*, *L. wordsworthiae*, *Ruschia lavisii*. Semiparasitic Shrubs: *Thesium brachygyne*, *T. quinqueflorum*. Herbs: *Centella pilosa*, *Charadrophila capensis*W, *Galium rourkei*, *Peucedanum triternatum*. Geophytic Herbs: *Agapanthus walshii*, *Disa begleyi*, *D. brevipetala*, *Geissorhiza lithicola*, *Gladiolus nerineoides*, *Ixia esterhuyseniae*, *Watsonia distans*W. Carnivorous Herb: *Drosera esterhuyseniae*W. Graminoids: *Restio bifarius* (d), *Askidiosperma esterhuyseniae*, *Calopsis nudiflora*, *C. sparsa*, *Ficinia minutiflora*, *Hypodiscus alternans*, *Ischyrolepis saxatilis*, *Restio distans*, *R. fusiformis*, *R. involutus*, *R. nuwebergensis*, *R. verrucosus*, *Tetraria crassa*, *Willdenowia purpurea*, *W. rugosa*.

**Conservation** Least threatened. Target 30%. The unit is statutorily well conserved (58%) in the Hottentots Holland and Groenlandberg Nature Reserves and especially in the Kogelberg Biosphere Reserve (including Kogelberg and Kleinmond Nature Reserves). An additional 18% protected in the Hottentots-Holland Mountains catchment area. Some 17% transformed (pine plantations, cultivation, urban sprawl and spread of informal settlements). Aliens *Pinus pinaster* and *Hakea sericea* have been targeted for clearing, but remain of concern in some areas. Erosion very low.

**Remark 1** Vegetation of this unit wasreasonably well surveyed at Kogelberg, Jonkershoek, Jakkalshoek and Haasvlakte. Data suggest that this vegetation unit might perhaps be divided into two or three units, but the boundaries are not obvious—Sir Lowry’s and Viljoen’s Passes appear to be the boundary of a northern Jonkershoek subunit, and the Kogelberg subunit may perhaps be further subdivided with a northern Groenlandberg subunit separated between the Highlands and Houwhoek Passes. However, at present there are insufficient data to verify this.

**Remark 2** In this unit, more than any other, Sandstone Fynbos communities are floristically quite distinctive in that local patches may be dominated by species that are rare in similar communities elsewhere. Matching communities floristically from similar habitats across the region is therefore very difficult. Even structural types vary from ericaceous to restioid to proteoid across matched habitats for no obviously discernable reasons.

**Remark 3** This is the heart of the Cape flora—a true crown jewel of the temperate flora of the world. The species-level endemism is staggering and this unit contains two endemic genera, *Charadrophila* (still unclear whether Stilbaceae or Scrophulariaceae) and *Glischrocolla* (Penaeaceae). Monotypic genera occurring also outside this unit include *Atrichantha, Audouinia, Bryomorphe, Capeobolus, Empleuridium, Euthystachys, Evotella, Glia, Itasina, Lanaria, Mystropetalon, Neesenbeckia, Oreoleysera, Phaenocoma, Saltera* and *Witsenia.* Endemic Cape genera such as *Retzia, Orothamnus, Pillansia* and *Sonderothamnus* are shared only with FFs 12 Overberg Sandstone Fynbos*.* Genera such as *Anaxeton, Aulax, Bolusafra, Brunia, Capelio, Calopsis, Chrysitrix, Cliffortia, Diastella, Dilatris, Disa, Elegia, Erica, Euryops, Grubbia, Helichrysum, Hermas, Hypocalyptus, Klattia, Liparia, Metalasia, Mimetes, Muraltia, Oldenburgia, Osmitopsis, Prismatocarpus, Protea, Raspalia, Restio, Siphocodon, Spatalla, Staavia, Syncarpha, Thaminophyllum, Thesium, Ursinia* and *Wachendorfia* are either remarkably species-rich in this unit or have most of the extant species of the genus in this area. The unit contains representatives of almost all endemic families of the CFR (or of the Cape Floristic Kingdom) (the only notable exception being Geissolomataceae of the Langeberg). Many of the endemics are confined to vulnerable wetland habitats (mainly seeps) or are found in sheltered rocky habitats such as on steep cliffs. Many species still await formal description.

**Remark 4** Shale bands are a prominent feature in the landscape, with areas below the shale band predominantly proteoid fynbos, whereas above the shale band ericaceous and restioid fynbos predominate. It is unclear whether this is due to the Nardouw sandstones being relatively nutrient-poor compared to the Peninsula sandstones, or due to nutrient input from the shale.

**References** Van der Merwe (1962, 1966), Boucher (1972, 1977, 1978, 1988a, 1996b), Werger et al. (1972a, b), Kruger (1979), Durand (1981), Burman & Bean (1985), McDonald (1985, 1987, 1988), Davis (1988), Boucher & Stindt (1992), Sieben (2003), Sieben et al. (2004), Bean & Johns (2005).