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The present status of vegetation conservation in South Africa

J. C. SCHEEPERS*

ABSTRACT

Progress with the conservation of representative stands of the great variety of South African ecosystems, as represented by vegetation types, is reviewed against progress towards better co-ordinated and national planning of the various conservation activities pursued by different conservation authorities.

RÉSUMÉ

LE STATUT ACTUEL DE LA CONSERVATION DE LA VÉGÉTATION EN AFRIQUE DU SUD

Les progrès obtenus dans la conservation de zones représentatives de la grande variété d'écosystèmes sud-africains, tels qu'ils sont représentés par des types de végétation, sont examinés en les comparant avec ceux réalisés pour établir un programme à l'échelle nationale et mieux coordonné des diverses activités de conservation poursuivies par différentes autorités responsables.

A great deal has happened during the sixteen years since the 1966 AETFAT meeting on 'Conservation of vegetation in Africa south of the Sahara'. This paper can only summarize the main developments, assess trends and attempt to derive conclusions regarding the present conservation status of vegetation in South Africa.

In the light of Hedberg's (1976) follow-up report, it is necessary to refer to the Uppsala meeting where Codd (1968) in his regional synthesis pointed out that greater co-ordination was needed between the various bodies concerned with conservation of indigenous vegetation. This is gradually coming about and will be referred to again.

At the 1966 AETFAT meeting, Rycroft, reporting on the situation in the Cape Province, recommended the creation of extensive nature reserves to conserve mountain fynbos, Karoo Succulent Steppe, Subdesert (Karoo Shrub and Grass), and subdesert Steppe, using the nomenclature of the AETFAT vegetation map (Keay, 1959).

Also using the AETFAT nomenclature, Killick, briefly described the five vegetation types in the Transvaal and discussed their conservation status at that time. He suggested that it would be far more desirable for conservation status of vegetation types to be assessed on the basis of Acocks's Veld Types (1975) rather than the vegetation types used in the AETFAT map. He recommended that each veld type should contain one or more reserves containing a representative stand of the veld type. This view immediately gained wide acceptance throughout South Africa. Killick also suggested that steps should be taken to conserve all forest — even on privately owned land.

Bayer, Bigalke and Crass similarly described the occurrence of the five AETFAT vegetation types in Natal, and discussed their conservation status. By implication, they also suggested that the AETFAT vegetation types were not sufficiently fine for assessing adequacy of conservation coverage. They recommended that protection be extended to suitable stands of swamp forest, mangroves, coast forest and dune forest.

Roberts discussed four AETFAT vegetation types found in the Orange Free State. He recommended that protection be given to the two main variations of wooded steppe (*Acacia* Savanna) equivalent to Acocks's Veld Type No. 16 (Kalahari Thornveld and Shrub Bushveld). He also recommended that a greater area should be conserved of the subdesert steppe (Karroid Grassland) of various types. As pointed out by Hedberg (1976), the latter need has been partially met by Tussen-die-Riviere Game Farm.

Against the foregoing historical background, a milestone was reached with the review of the status of conservation in the Republic of South Africa, being a South African contribution to Section CT (Conservation of Terrestrial Communities) of the International Biological Programme. While the investigations reported on were stimulated by the international programme, the accent of the review was on national rather than international needs. Of prime importance was the report of Edwards (1974), on a broad survey of the conservation status of South African vegetation. Statistical data and maps showed the distribution and total areas conserved by various conservation agencies, the size distribution of nature reserves, and the areas and percentages of conserved areas in relation to Acocks's 70 veld types and seven main vegetation types. Major conservation deficiencies lay in the Karoo and Karroid Bushveld and Grassland vegetation types, where 42 veld types had no or practically no conservation. In the Tropical Bush and Savanna Types, nine veld types were found to be extremely lacking in conservation. Additional reserves were seen to be needed to conserve certain important and local ecosystems and species in the remaining 18 veld types, especially the Sclerophyllous Bush (Fynbos) and Temperate and Transitional Forest and Scrub Types and in certain Coastal Tropical Forest and Thornveld Types. Apart from minor shortcomings, the conservation status was outstanding for six of

* Botanical Research Institute, Department of Agriculture, Private Bag X101, Pretoria 0001, South Africa.

these 18 veld types (up to 46 per cent conserved) and very good for another six veld types.

Meanwhile, the National Committee for Nature Conservation (NAKOR) had been established in 1963 to promote and co-ordinate nature conservation in South Africa through co-operation between all of the official nature conservation bodies, without in any way detracting from the autonomy of any of these bodies. NAKOR initiated a National Plan for Nature Conservation at the request of the then Department of Planning and the Environment (now the Department of Environment Affairs) that would integrate and co-ordinate the National Plan for Nature Conservation with other planning towards the National Physical Development Plan and regional development plans.

A series of questionnaires was drawn up and sent out to the conservation bodies concerned, and this exercise is repeated annually to update the National Plan. These questionnaires relate to existing permanent conservation areas, planned or proposed conservation areas, and remaining future conservation needs. The adequacy of existing and planned future coverage, and the remaining future conservation needs are assessed from different points of view, e.g. conservation of veld types, conservation of special plant communities, and conservation of special habitats of threatened species.

To date, facilities for the storage, retrieval and processing of data and for mapping have been provided by the Botanical Research Institute of the Department of Agriculture. Until recently the Botanical Research Institute provided the services of a part-time co-ordinator and part-time technical support. The Department of Environment Affairs now provides a full-time co-ordinator with supporting staff, as well as the Secretariat, and will soon assume responsibility for data processing and mapping.

The National Plan for Nature Conservation is an on-going project of an open-ended nature. The data base is annually updated, and maps and co-ordinated plans are reviewed at convenient intervals. Compilations of information derived from the questionnaires and maps are used at planning workshops to determine conservation priorities at national and provincial levels.

With regard to the conservation of vegetation, Table 1 provides a brief summary of the current

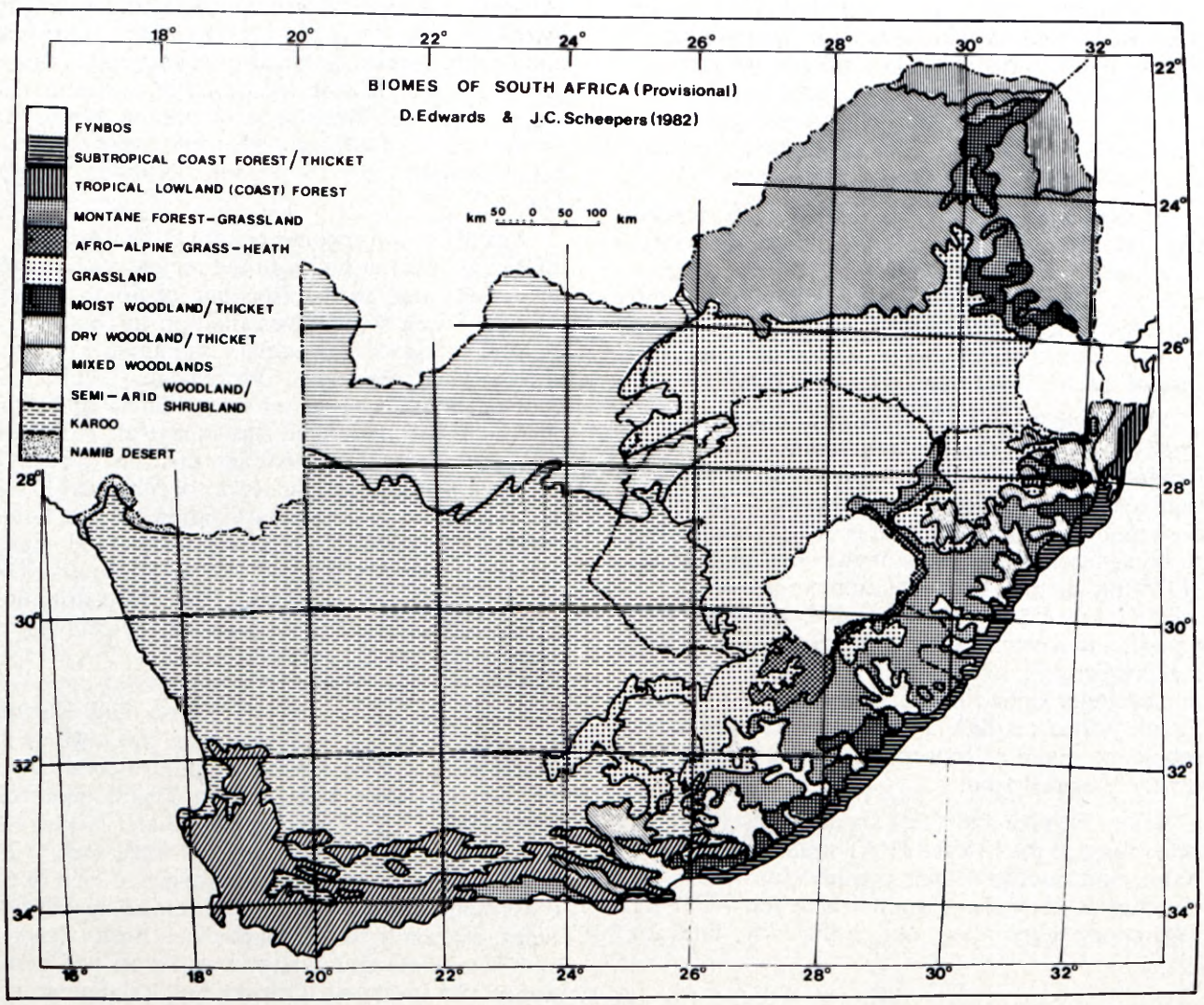

FIG. 1.—Provisional map of the biomes of South Africa.

TABLE 1. – Percentage areas conserved of various veld types (NB. These statistics are based on questionnaire-derived data and are subject to error)

Veld Type No.	Area of Veld Type (ha)	Area of Veld Type conserved (ha)	Percentage of area of Veld Type conserved %
1	2 639 950,0	34 367	1,30
2	210 890,0	150	0,07
3	83 310,0	3 400	4,08
4	402 090,0	13 901	3,46
5	1 196 580,0	11 144	0,93
6	356 450,0	21 200	5,95
7	645 520,0	200	0,03
8	952 840,0	30 559	3,21
9	1 194 180,0	77 133	6,46
10	2 379 710,0	528 840	22,2
11	1 900 450,0	590 835	31,1
12	587 920,0	0	0
13	839 350,0	300	0,04
14	1 822 050,0	4 766	0,26
15	2 086 810,0	853 067	40,9
16	13 908 190,0	986 826	7,0
17	1 804 570,0	700	0,04
18	3 986 720,0	63 384	1,59
19	3 448 180,0	15 293	0,44
20	1 301 870,0	50 901	2,27
21	389 150,0	35	0,009
22	462 230,0	0	0
23	2 716 710,0	29 720	1,09
24	274 350,0	0	0
25	935 880,0	6 900	0,74
26	3 378 590,0	4 710	0,14
27	1 956 930,0	320	0,02
28	2 135 760,0	1 760	0,08
29	7 688 440,0	760	0,01
30	1 115 240,0	0	0
31	3 714 910,0	540	0,01
32	3 714 190,0	9 485	0,25
33	2 810 590,0	4 600	0,16
34	733 540,0	3 306	0,45
35	2 783 870,0	0	0
36	5 983 060,0	63 849	1,06
37	1 107 060,0	11 521	1,04
38	119 150,0	0	0
39	119 540,0	0	0
40	617 420,0	0	0
41	121 750,0	0	0
42	225 870,0	2 849	1,26
43	621 280,0	75 177	12,10
44	3 173 780,0	101 397	3,19
45	394 480,0	618	0,15
46	178 880,0	10 530	0,59
47	928 870,0	22 503	2,42
48	3 753 160,0	903	0,02
49	1 714 730,0	7 300	0,43
50	4 707 150,0	13 530	0,29
51	275 780,0	0	0
52	1 079 790,0	0	0
53	1 211 510,0	0	0
54	290 240,0	379	0,13
55	62 910,0	0	0
56	989 980,0	1 206	0,12
57	1 475 200,0	1 000	0,68
58	980 080,0	63 493	6,48
59	256 720,0	0	0
60	1 522 320,0	1 249	0,082
61	3 003 360,0	17 148	0,57
62	151 940,0	0	0
63	788 830,0	6 075	0,77
64	540 580,0	11 415	2,11
65	1 843 740,0	3 829	0,21
66	577 160,0	0	0
67	248 990,0	0	0
68	67 330,0	0	0
69	1 980 130,0	664 303	33,55
70	1 747 290,0	37 508	2,15

conservation status of veld types. The names of the various veld types are given in the Appendix. To facilitate understanding, the veld types are grouped into several biome types as mapped in Fig. 1. On this basis, the conservation status of the various biomes can be assessed (Table 2). An important point to remember in evaluating the conservation coverage of veld types is that a number of veld types, namely the so-called 'false' veld types of Acocks, are secondary, having been derived from the original natural vegetation as a result of overgrazing and trampling, over-burning, and also under-utilization and selective grazing. It would seem pointless to conserve and maintain these in their abused state by continued malpractice, failing which they will revert to the more natural condition, as is happening in the Tussen-die-Riviere Game Farm in the False Upper Karoo (Werger, 1973). From Table 2 it will be seen that the conservation status of the Grassland Biome, particularly the Highveld Grasslands, is particularly low. This is cause for grave concern owing to the serious threat posed by agricultural intensification and other developments.

To summarize the present position, it can be seen that, although changes have taken place since the survey of Edwards (1974), the general picture remains substantially the same as previously reported. The preponderance of conservation effort is concentrated in the veld types of the eastern and southern parts of South Africa. In contrast, almost negligible conservation is found in the semi-arid to arid western parts of the country.

Regarding the conservation of special plant communities, the information to date is patchy and reflects the fact that no standard acceptable list of special plant communities exists at present. Nevertheless, much interesting information has come to light but much more data are still required. The standardization of South African plant-community nomenclature is now receiving attention and this will help to systematize the conservation of special plant communities and put it on a sound footing.

With regard to Killick's report at the 1966 AETFAT meeting, the first step towards the all-embracing conservation of forest has been taken. The Wildlife Society of Southern Africa has launched a survey, enlisting the co-operation of its wide membership including predominantly the lay public, to ascertain the answers to the following questions: Where are all the forests on private land? What is their condition? Is their continued existence threatened in any way? What special features distinguish each forest? Which forests should be selected for conservation action? The Botanical Research Institute will provide professional and technical assistance where required. A report will be submitted to NAKOR in due course.

The position in regard to the conservation of threatened plant species gives cause for concern. A major handicap both for the official conservation agencies and for NAKOR in its function of co-ordinating conservation activities and plans, has been the lack, until recently, of an authoritative list of threatened plant species. The Working Group for Threatened Plant Species (of the Terrestrial Biology

TABLE 2. – Conservation status of South African biomes (with regional subtypes). The statistics are based on questionnaire-derived data and are subject to error

Biome – *Regional subtype* (with percentage area of South Africa and actual extent covered)	Area conserved ha	Percentage area conserved %
1. **Fynbos biome** (3,96%; 48 351,7 km²)	734 844	15,19
(a) *Mountain Fynbos (& Forest)* (3,05%; 37 274,2 km²) Veld types 69 & 70	701 811	18,8
(b) *Lowland Fynbos* (0,91%; 11 077,5 km²) Veld types 46 & 47	33 033	2,98
2. **Subtropical coast forest biome** (1,42%; 116 434,9 km²)	23 267	1,60
(a) *South-eastern* (1,2%; 14 326,0 km²) Veld type 1 (south of St Lucia)	23 117	1,61
(b) *Southern* (Alexandria Forest) (0,17%; 2 108,9 km²) Veld type 2	150	0,07
3. **Tropical lowland (coast) forest biome** *Veld type 1 (north of St Lucia)* (3,85%; 46 985,0 km²)	115 916	2,5
4. **Montane forest biome** (2,74%; 33 466,7 km²)	161 019	6,86
(a) *Montane* (0,91%; 11 139,5 km²) Veld types 4,44 & 45	115 916	10,4
(b) *Submontane* (1,83%; 22 327,2 km²) Veld types 3,5 & 8	45 103	2,02
5. **Afro-alpine grass-heath biome** (8,03%; 9 800,8 km²) *(including Subalpine) Veld type 58*	63 493	6,48
6. **South African grassland biome** (20,7%; 243 124,3 km²)	64 034	0,26
(a) *Eastern Grasslands* (3,07%; 37 503,1 km²) Veld types 63, 64, 65 & 66	21 319	0,57
(b) *Highveld Grasslands* (16,84%; 205 621,2 km²) Veld types 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 68	42 715	0,21
7. **Moist woodland biome** (including scrub and savanna intergrades) (1,8%; 21 961,5 km²)	98 533	4,49
(a) *Eastern* (1,27%; 15 506,3 km²) Veld types 6 & 9	98 333	6,34
(b) *South-eastern* (0,53%; 6 455,2 km²) Veld type 7	200	0,03
8 **Dry woodland biome** (including scrub and savanna intergrades) (1,99%; 24 292,1 km²)	860 884	3,5
(a) *Mopane* (1,71%; 20 868,1 km²) Veld type 15	853 067	40,88
(b) Pteleopsis – Newtonia *Dry Forest/Thicket* (0,28%; 3 424,0 km²) Veld types 1 & 10 (both in northern part of St Lucia)	7 817	2,28
9. **Savanna biome** (including scrub) (28,9%; 353 150,3 km²)	227 160	6,43
(a) *Transvaal Bushveld* (9,4%; 114 796,7 km²) Veld types 12, 13, 14, 18, 19, 20, 67	134 644	1,17
(b) *Eastern Transvaal Lowveld* (3,5%; 42 801,6 km²) Veld types 10 & 11	1 119 675	26,16
(c) *Kalahari Scrub and Thornveld* (12,87%; 157 127,6 km²) Veld types 16 & 17	987 526	6,28
(d) *South-eastern Karroid Scrub and Thornveld* (3,15%; 38 424,4 km²) Veld types 21, 22, 23, 24	29 755	0,7
10. **Karoo** (26,27%; 320 759,48 km²)	181 277	0,565
(a) *Succulent Karoo* (6,71%; 81 949,2 km²) Veld types 25, 31, 33, 34, 39	11 206	0,137
(b) *Central Karoo* (13,37%; 163 241,38 km²) Veld types 26, 27, 28, 29, 30, 32, 35, 40, 43	92 212	0,565
(c) *Karoo – Grass Transition* (6,19%; 75 568,9 km²)	77 859	1,03
11. **Namib desert biome** (0,167%; 1 313 km²) Small parts of Veld types 31, 33 and 34 in vicinity of lower Orange River	8 446	6,43

Section of the National Programme for Environmental Sciences) has been working for several years to draw up a list of threatened plant species. This has now been published (Hall *et al.*, 1980) and a lead can be given to the conservation agencies. The list is essentially a first draft and much more research needs to be done before the conservation of threatened plant species can be planned and put into practice on a scientific basis.

In brief, while there are encouraging signs of progress, it is clear that the conservation status of the South African flora and vegetation is still deficient in a number of respects. To make good these deficiencies is a challenging and important task that will demand a great deal of hard work in the years ahead.

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APPENDIX: VELD TYPES

I COASTAL TROPICAL FOREST TYPES
- Veld Type No. 1 Coastal Forest and Thornveld
- 2 The Alexandria Forest
- 3 The Pondoland Coastal Plateau Sourveld
- 4 The Knysna Forest
- 5 The 'nGongoni Veld
- 6 The Zululand Thornveld
- 7 The Eastern Province Thornveld

II INLAND TROPICAL FOREST TYPES
- 8 North-eastern Mountain Sourveld
- 9 Lowveld Sour Bushveld

III TROPICAL BUSH AND SAVANNA TYPES (BUSHVELD)
- 10 Lowveld
- 11 Arid Lowveld
- 12 Springbok Flats Turf Thornveld
- 13 Other Turf Thornveld
- 14 Arid Sweet Bushveld
- 15 Mopani Veld
- 16 Kalahari Thornveld
- 17 Kalahari Thornveld Invaded by Karoo
- 18 Mixed Bushveld
- 19 Sourish Mixed Bushveld
- 20 Sour Bushveld

III A FALSE BUSHVELD TYPES
- 21 False Thornveld of Eastern Cape
- 22 Invasion of Grassland by Thorn

IV KAROO AND KARROID TYPES
- 23 Valley Bushveld
- 24 The Noorsveld
- 25 Succulent Mountain Scrub (Spekboomveld)
- 26 Karroid Broken Veld
- 27 Central Upper Karoo
- 28 Western Mountain Karoo
- 29 Arid Karoo
- 30 Central Lower Karoo
- 31 Succulent Karoo
- 32 The Orange River Broken Veld
- 33 The Namaqualand Broken Veld
- 34 Strandveld

IV A FALSE KAROO TYPES
- 35 False Arid Karoo
- 36 False Upper Karoo
- 37 False Karroid Broken Veld
- 38 False Central Lower Karoo
- 39 False Succulent Karoo
- 40 False Orange River Broken Veld
- 41 Pan Turf Veld Invaded by Karoo
- 42 Karroid *Merxmuellera* Mountain Veld Replaced by Karoo
- 43 Mountain Rhenosterbosveld

V TEMPERATE AND TRANSITIONAL FOREST AND SCRUB TYPES
- 44 Highland Sourveld and Dohne Sourveld
- 45 Natal Mist Belt 'nGongoni Veld
- 46 Coastal Rhenosterbosveld
- 47 Coastal Macchia

VI PURE GRASSVELD TYPES
- 48 *Cymbopogon–Themeda* Veld
- 49 Transitional *Cymbopogon–Themeda* Veld
- 50 Dry *Cymbopogon–Themeda* Veld
- 51 Pan Turf Veld
- 52 *Themeda* Veld or Turf Highveld
- 53 Patchy Highveld to *Cymbopogon–Themeda* Veld Transition
- 54 Turf Highveld to Highland Sourveld Transition
- 55 Bankenveld to Turf Highveld Transition
- 56 Highland Sourveld to *Cymbopogon–Themeda* Veld Transition
- 57 North-Eastern Sandy Highveld
- 58 *Themeda–Festuca* Alpine Veld
- 59 Stormberg Plateau Sweetveld
- 60 Karroid *Merxmuellera* Mountain Veld

VI A FALSE GRASSVELD TYPES
- 61 Bankenveld
- 62 Bankenveld to Sour Sandveld Transition
- 63 Piet Retief Sourveld
- 64 Northern Tall Grassveld
- 65 Southern Tall Grassveld
- 66 Natal Sour Sandveld
- 67 Pietersburg Plateau False Grassveld
- 68 Eastern Province Grassveld

VII SCLEROPHYLLOUS BUSH TYPES
- 69 Fynbos

VII A FALSE SCLEROPHYLLOUS BUSH TYPES
- 70 False Fynbos