# A.S.F. MEMBERSHIP DEMOGRAPHY

I.S. BOGG* & A.J. PAVEY†
Blue Mountains Speleo. Club & Uni. of N.S.W. Speleo. Soc.

*Abstract*

*Historical membership data based on Australian Speleological Federation (A.S.F.) Capitation numbers has been collected and analysed. Predictions for growth of member society numbers and total A.S.F. membership are made according to computed linear regessions. Increases are related to growth and popularity of caving and general societal changes. Recommendations are made for changes in A.S.F. Capitation and membership policies to improve the A.S.F's representativeness. An individual A.S.F. member number is proposed to allow analysis of membership dropout rates.*

## INTRODUCTION

This paper represents the first detailed study of the membership of the Australian Speleological Federation (A.S.F.). Whilst some membership data has been previously published, no attempt has hitherto been made to analyse membership trends and to predict what will happen in the future. We have, therefore, taken an historical overview upon which predictions have been made of membership of the A.S.F.

## DATA SOURCE

The raw data on A.S.F. membership is the total membership covered by A.S.F. capitation payments (Annual levy per member per society).

Whilst the A.S.F. capitation fee does not represent the total membership of the A.S.F. societies, it does reflect society and therefore A.S.F. growth in real terms, as A.S.F. capitation payments are generally regarded as being representative of the "full" membership component which in turn is indicative of the more stable segment of society membership.

In addition, a comparision was undertaken between the Australian data and the United States of America (U.S.A.) data (Wefer, 1971). Unlike the A.S.F., the National Speleological Society (N.S.S.) in the U.S.A. is based on individual membership and some of these individuals club together to form grottos.

## MEMBERSHIP PREDICTIONS

The primary raw data is given in Table 1, upon which a number of linear regressions were computed to enable predctions to be made as to when A.S.F. membership will reach 1000 members and what the membership will be in 1990.

Although the correlations are quite satisfactory, the membership oscillates past the line of best fit sufficiently for us to be wary in using the equations 1-4 (see Appendix A).

*29 Scott Street, SPRINGWOOD, N.S.W. 2777

†45 Arcadia Street, GLEBE, N.S.W. 4068

Table 1

A.S.F. membership analysis and comparisons

(based upon A.S.F. capitation payments)

| STATE | 1978 | 1977 | 1976 | 1975 | 1974 | 1973 | 1972 | 1971 | 1970 | 1969 |
|---|---|---|---|---|---|---|---|---|---|---|
| Queensland | | | | | | | | | | |
| Clubs | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| Membership | 49 | 71 | 69 | 64 | 75 | 40 | 66 | 75 | 70 | 54 |
| 3 year av. | 63 | 68 | 69 | 60 | 60 | 60 | 70 | 66 | - | - |
| Trend index | 95 | 103 | 105 | 91 | 91 | 91 | 106 | 100 | - | - |
| % natl memb. | 8.2 | 9.7 | 10.0 | 10.1 | 11.2 | 6.5 | 11.2 | 12.8 | 13.2 | 11.7 |
| N.S.W. & A.C.T. | | | | | | | | | | |
| Clubs | 12 | 14 | 14 | 13 | 12 | 12 | 10 | 10 | 11 | 11 |
| Membership | 298 | 416 | 394 | 354 | 358 | 376 | 300 | 319 | 281 | 298 |
| 3 year av. | 369 | 388 | 369 | 363 | 345 | 331 | 300 | 299 | - | - |
| Trend index | 123 | 130 | 123 | 121 | 115 | 111 | 100 | 100 | - | - |
| % natl memb. | 20.7 | 56.7 | 56.9 | 55.7 | 53.3 | 61.3 | 51.0 | 54.3 | 52.9 | 64.8 |
| Victoria | | | | | | | | | | |
| Clubs | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Membership | 75 | 67 | 55 | 42 | 59 | 77 | 75 | 51 | 48 | 36 |
| 3 year av. | 66 | 55 | 52 | 59 | 70 | 68 | 58 | 45 | - | - |
| Trend index | 146 | 122 | 116 | 131 | 156 | 151 | 129 | 100 | - | - |
| % natl memb. | 12.6 | 9.2 | 7.4 | 6.6 | 8.8 | 12.6 | 12.8 | 8.7 | 9.0 | 7.8 |
| Tasmania | | | | | | | | | | |
| Clubs | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 |
| Membership | 48 | 45 | 68 | 60 | 62 | 30 | 53 | 55 | 25 | 25 |
| 3 year av. | 54 | 58 | 63 | 51 | 48 | 46 | 44 | 35 | - | - |
| Trend index | 154 | 166 | 180 | 146 | 137 | 131 | 126 | 100 | - | - |
| % natl memb. | 8.1 | 6.2 | 9.8 | 9.4 | 9.2 | 4.9 | 9.0 | 9.4 | 4.7 | 5.4 |
| South Aust. | | | | | | | | | | |
| Clubs | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Membership | 58 | 56 | 52 | 58 | 54 | 47 | 51 | 45 | 45 | 47 |
| 3 year av. | 55 | 55 | 55 | 63 | 51 | 48 | 47 | 46 | - | - |
| Trend index | 120 | 120 | 120 | 115 | 111 | 104 | 102 | 100 | - | - |
| % natl memb. | 9.8 | 7.7 | 7.5 | 9.1 | 8.0 | 7.7 | 8.7 | 7.7 | 8.5 | 10.2 |
| Western Aust. | | | | | | | | | | |
| Clubs | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Membership | 68 | 77 | 55 | 58 | 64 | 43 | 43 | 43 | 62 | n.a. |
| 3 year av. | 67 | 63 | 59 | 55 | 50 | 43 | 49 | - | - | - |
| Trend index | 137 | 129 | 120 | 112 | 102 | 88 | 100 | - | - | - |
| % natl memb. | 11.4 | 10.5 | 7.9 | 9.1 | 9.5 | 7.0 | 7.3 | 7.3 | 11.7 | - |
| National A.S.F. | | | | | | | | | | |
| Clubs | 18 | 22 | 22 | 21 | 20 | 19 | 17 | 17 | 16 | 15 |
| Membership | 596 | 732 | 693 | 636 | 672 | 613 | 588 | 543 | 531 | 460 |
| 3 year av. | 674 | 687 | 667 | 640 | 624 | 581 | 554 | 511 | - | - |
| Trend index | 132 | 134 | 131 | 125 | 122 | 114 | 108 | 100 | - | - |

Using equation No. 2 (best correlation) and equation No. 4 (most data) membership projections were computed and these are shown in Table 2. Perusal of Table 2 indicates that the fit is fairly good in the mid 70's in both cases, but in basing forward projections on the derived equations note should be made of just how much divergence is built-in back to 1961. With these limitations in mind, the two projections were made, the results being:

| Equation No. | 1000 Members | Membership 1990 | Correlation Coefficient |
|---|---|---|---|
| 1 | 1987 | 1109 | 0.81 |
| 2 | 1982 | 1451 | 0.96 |
| 3 | 1987 | 1098 | 0.93 |
| 4 | 1990 | 996 | 0.90 |

As shown, there is a spread of 8 years between the optimistic and pessimistic growth estimates to 1000 members, and a spread of about 50% in the 1990 estimates.

In comparison with the American data, we have a large "intercept" meaning we started with relatively more members in the formative years of the A.S.F. but have not had the groth at anywhere near the U.S.A. rate. It is suspected that this refelects the difference between joining the N.S.S. as an individual member, and the difficulty in getting into a society, and that society then being admitted as a "Full" member of the A.S.F., and the practice of paying A.S.F. capitation for "full" members only. If the total membership of each society were covered by capitation payments, the membership would probably show a higher growth rate.

A preliminary sampling of the relationship between the membership covered by capitation payments and the total society membership indicates that approximately 60% of the total society membership is covered by the capitation payments. However the sample is not sufficiently large enough to be conclusive. Capitation based on all fee paying members of each society would increase A.S.F. funds and give the A.S.F. a larger and more representative membership total.

## SOCIETY MEMBERSHIP STRENGTH

Over the analysis period, the average membership per society has been remarkably stable at around 33 members. However, the number of societies in the A.S.F. versus time varies more slowly, about one society every two years, and on this basis we would expect some 31 societies as members of the A.S.F. by 1990.

It is worthwhile to note that this situation is not the same as Wefer found in the N.S.S. He found that the number of members per grotto (society) was predicted to rise from 32.1 in 1970 to 44.3 in 2000 and that the number of grottos per state would grow rapidly from 2.2 per state to 19.5 per state by 2000. Thus in the N.S.S. the number of members in a grotto is expected to grow slowly while the number of grottos grows rapidly.

In contrast, if the A.S.F. continues its historic attitudes regarding membership, excluding associate status, then A.S.F. membership is predicted to rise by just less than 50% from the current 22 societies to 31 societies in 1990.

Table 2

A.S.F. Members vs Year

| YEAR | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw Data | 455 | - | 400 | 450 | - | - | - | - | 460 | 531 | 543 | 588 | 613 | 672 | 636 | 693 | 732 | 596 | - |
| Predicted Equation 2 | 323 | 340 | 358 | 377 | 397 | 418 | 440 | 463 | 488 | 514 | 542 | 571 | 601 | 633 | 667 | 702 | 740 | 779 | 820 |
| Predicted Equation 4 | 408 | 421 | 434 | 448 | 462 | 477 | 492 | 508 | 524 | 540 | 558 | 575 | 593 | 612 | 632 | 651 | 672 | 693 | 715 |

Notes: Raw data represents the total number of cavers covered by A.S.F. Capitation payments.

# BOGG & PAVEY – A.S.F. MEMBERSHIP DEMOGRAPHY

## IS THE A.S.F. REPRESENTATIVE?

What is really happening in the Australian caving community, is that more and more groups are being formed but, they are not being admitted into the A.S.F. as "Full" members. The number of societies known to the N.S.W. Speleological Council which is 33 in 1978, will testify to this (N.S.W. Speleological Council Annual Report, 1977). We expect this situation would apply in other States but at this juncture, adequate data are not available regarding the number of non-A.S.F. groups nor the membership that they would represent, on a State by State basis. If we assume that the average membership strength is 33 members per society, then it is obvious that the A.S.F. cannot lay claim to being a truly representative national body. Using the N.S.W. situation as a basis, we estimate total potential membership to be around 1000 in 1978 of which 416 are currently full members of A.S.F. societies.

Clearly it is the A.S.F's challenge to get these groups under the wing in the first instance and eventually encourage them into becoming "Full" members, of the A.S.F. A result of such a policy would be that the A.S.F. could expect a greater drop out rate as it would no longer be selecting for membership on a sole basis of established "stability" as is currently required of an applicant society.

## MEMBERSHIP DISTRIBUTION

In all states, except N.S.W., membership of the A.S.F. (cavers per State) has been fairly stable (see Table 1) with some growth being evidenced recently. Each State, except N.S.W., has had a reasonably constant 7-10% of total membership of the A.S.F. N.S.W. is the "high flier" in A.S.F. membership and its high percentage of total A.S.F. membership is remarkably stable.

On a per capita basis (see Table 3) both Queensland and Victoria are the "odd ones out" which is due possibly to cave area remoteness relative to centres of major population and the difficulties of "access".

It is obvious that there is a greater awareness of caves as a recreational resource and of caving as a sport, as shown by the steady increase in the per capita ratios. In 1970 there was one A.S.F. member for each 23 700 persons and in 1977 one for each 19 100 persons. In the same period there was a national population increase of 11%.

## DROPOUTS

The N.S.S. in the U.S.A. assigns a membership number to each member. This number is not re-issued if the member leaves the N.S.S. but is re-assigned if the member rejoins. Thus Wefer (1971) was able from yearly membership data and the highest assigned N.S.S. number to calculate membership dropout rates. This we have not been able to do for the A.S.F. as it would require access to complete membership lists for each society since it joined the A.S.F. and considerable work to sort the long term members from the short term members.

Thus we are not able to determine average caving "lifetimes" for the A.S.F. population and hence confirm or deny the popularly held belief that most cavers belong to a club for only two years on average.

We recommend that the A.S.F. consider adopting a unique identification number for each member and suggest that only a small modification to the current A.S.F. Newsletter address list system would be sufficient. Namely the number currently

Table 3

Cavers per capita comparisons

(ratio of cavers to population)

| STATE | DATA | 1977 | 1976 | 1975 | 1974 | 1973 | 1972 | 1971 | 1970 |
|---|---|---|---|---|---|---|---|---|---|
| Queensland | Population (000) | 2136.8 | 2111.7 | 2084.0 | 2046.1 | 1987.3 | 1943.5 | 1852.3 | 1812.8 |
| | Cavers | 71 | 69 | 64 | 75 | 40 | 66 | 75 | 70 |
| | Ratio 1:(000) | 30.1 | 45.1 | 32.6 | 27.3 | 49.9 | 29.3 | 24.7 | 25.9 |
| New South Wales & A.C.T. | Population (000) | 5164.9 | 5117.6 | 5075.4 | 5015.1 | 4961.5 | 4904.9 | 4802.3 | 4711.3 |
| | Cavers | 416 | 394 | 354 | 358 | 376 | 300 | 319 | 281 |
| | Ratio 1:(000) | 12.4 | 23.0 | 14.3 | 14.0 | 13.2 | 16.4 | 15.1 | 16.8 |
| Victoria | Population (000) | 3782.3 | 3746.0 | 3719.1 | 3676.8 | 3628.4 | 3577.4 | 3537.5 | 3842.0 |
| | Cavers | 67 | 55 | 42 | 59 | 77 | 75 | 51 | 48 |
| | Ratio 1:(000) | 56.5 | 68.1 | 88.6 | 62.3 | 47.1 | 47.7 | 69.4 | 72.5 |
| Tasmania | Population (000) | 410.6 | 407.4 | 404.7 | 399.3 | 395.7 | 392.2 | 392.8 | 390.3 |
| | Cavers | 45 | 68 | 60 | 62 | 30 | 53 | 55 | 25 |
| | Ratio 1:(000) | 9.1 | 6.0 | 6.8 | 6.4 | 13.2 | 7.4 | 7.1 | 15.6 |
| South Australia | Population (000) | 1276.8 | 1261.6 | 1252.1 | 1236.2 | 1217.9 | 1202.4 | 1185.5 | 1170.2 |
| | Cavers | 56 | 52 | 58 | 54 | 47 | 51 | 45 | 45 |
| | Ratio 1:(000) | 22.8 | 24.3 | 21.6 | 22.9 | 25.9 | 23.6 | 26.3 | 26.0 |
| Western Australia | Population (000) | 1197.1 | 1169.8 | 1146.7 | 1117.4 | 1089.3 | 1070.9 | 1048.9 | 1014.1 |
| | Cavers | 77 | 55 | 58 | 64 | 43 | 43 | 62 | 62 |
| | Ratio 1:(000) | 15.6 | 21.3 | 19.8 | 17.5 | 25.3 | 24.9 | 16.9 | 16.4 |
| National A.S.F. | Population (000) | 13968.6 | 13814.1 | 13682.0 | 13494.7 | 13280.7 | 13080.4 | 12819.3 | 12580.9 |
| | Cavers | 732 | 693 | 636 | 672 | 613 | 588 | 543 | 531 |
| | Ratio 1;(000) | 19.1 | 19.9 | 21.5 | 20.1 | 21.7 | 22.2 | 23.6 | 23.7 |

Notes: Population figures are as at 30 June except for 1970 and 1971 which are as at 30 December for each year.
National cavers and population figures exclude the Northern Territory.

used should not be re-assigned if the member drops out.

Society drop out rates have not been carefully examined due to a lack of data but at least seven societies which were once members have gone defunct, several others have been quiescent for several years and then recovered and two have resigned and later rejoined. Despite the A.S.F. striving for stability it is clear that the current policy does not eliminate the problem of a fair proportion of societies "dying".

## GROWTH FACTORS

We identify the following as significant factors in the growth of the number of cavers in the population in contrast to the slow growth of A.S.F. membership.

Education system. The encouragement of much greater outdoor recreational activity through schools, including geology excursions, wider definitions of "school sports", and formation of outdoor clubs and in the wider community government campaigns such as "Life, Be in it.", Outward Bound Schools, etc.

Publicity and Promotions. Greater public awareness of caves has occurred through television programmes and newspaper coverage of caving activities, feature articles in magazines and even our own conservation campaigns.

Scouts and Caving. The Scout Association has various objectives including encouragement of leadership, initiative, responsibility and adventure. Caves are seen as providing a resource for the development of these objectives without the necessity for a large capital expenditure to provide the facilities. Caving is seen by the Scouting hierachy as having sufficient sustainable resources for the majority to enjoy. This activity has had a multiplier effect with migration of scouts and former scouts into the established societies and/or into the formation of their own group.

Documentation. A.S.F. member societies have contributed to an explosion in the "commercial" documentation of our caves. With such publications as "Speleo Handbook", "Caves of the Nullarbor", "Australian Caves and Caving", "Mammoth Cave Jenolan", "S.A. Cave Reference Book", "Mt Etna Caves" and in particular "Bungonia Caves". These books have made it much easier for people to find out about caves and their locations than ever before with little significant contribution to the societies' long term capital funds.

Leisure and mobility. The population has gained increased leisure time through reduced working hours and innovations like flexitime. In addition greater unemployment and an increasing population distribution relative to caving areas have given greater opportunities for people to go caving. In real dollar terms transport has become relatively cheaper over the last ten years and levels of mobility within the society have increased substantially making both the access to caves and the means of getting there easier to come by. Improved road systems and surfaces have decreased travelling times to closer areas and encouraged people to travel further to reach caving areas.

## THE A.S.F'S COURSE OF ACTION

Unfortunately, we have probably progressed beyond the point of no return so far as attempting to depress the growth in numbers and awareness of caving. Clearly our aim must be to espouse the real advantages and benifits of joining the established societies and participating in our form of organised speleology

through public education. There is an inherent drawback with this policy and that is that the members of the A.S.F. must practise what they preach. "If we endorse it - we enforce it". In particular we should practise our own code of ethics. This will require the A.S.F. societies to tighten up their standard of practice and to develop a carefully planned and excuted policy of training, guidance, exposure, and supervision of prospective members. Our aim should be to quality and not quantity. Recruitment should be directed towards the genuinely interested individual rather than encouraging once only thrill seekers. The A.S.F. must continue to provide leadership for groups in formative stages and encourage them to join. Hence we should strive for a steady but stronger A.S.F. membership growth coupled with a much stronger society membership growth. An early step should be a change in the A.S.F. capitation policy to include all fee paying society members rather than just "full" members.

We believe that the A.S.F. must stop being exclusivist about membership and aim at involving every genuine and reasonably responsible group of cavers. The A.S.F. organisational arrangements must be capable of absorbing the growing and projected membership whilst fostering improvements in communications and co-operation. From the above must rise a strong sense of unity and direction to enable concise objectives and strategies to be formulated not only nationally but on a State basis also (Hamilton-Smith, 1978; Bunton, 1978).

## CONCLUSION

The number of A.S.F. member societies is growing at about one every two years and on average each society maintains about 33 "full" members. A.S.F. membership is not keeping pace with the growth of cavers in the community either on a society or national basis. The A.S.F. must alter its membership policies to include the growing number of new societies under its wing, unless it wishes to lose any claim to represent speleology in Australia which it may now have. The A.S.F. needs also to improve its behavioural image with regard to its code of ethics and safety. The A.S.F. should consider adoption of a membership number for each individual in A.S.F. societies and should base its funding upon all fee paying members of member societies rather than on "full" members.

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APPENDIX A

COMPUTATIONS

U.S.A. DATA

The number of U.S.A. members follows the function

$$N = 10.99_e^{0.0828t}$$

where t is the number of years since 1900.

AUSTRALIAN DATA

Linear regressions computed on $Log_e$NvsT.

1969-78 period inclusive (least squares line of best fit).

$$N = 39.25_e^{0.037t} \quad \ldots . \text{ Equation 1}$$

with a correlation coefficient of +0.81.
Note: 1978 figures are inconclusive as not all members financial.

1969-77 period inclusive.

$$N = 13.7_e^{0.0518t} \quad \ldots . \text{ Equation 2}$$

with a correlation coefficient of +0.964 (very good).

Additional membership data from A.S.F. Newsletter sampling:
1961, N = 455; 1963, N = 400; 1964, N = 450.

1961-77, all data.

$$N = 47.55_e^{0.035t} \quad \ldots . \text{ Equation 3}$$

with a correlation coefficient of +0.93.

1961-78, most data.

$$N = 61.2_e^{0.031t} \quad \ldots . \text{ Equation 4}$$

with a correlation coefficient of +0.90.