



**Australian Government**

**Department of the Environment, Water, Heritage and the Arts**

# **Survey of Australian Taxonomic Capacity**

## ***Part A***

### ***Survey of Taxonomic Workforce***

## ***Part B***

### ***Resources of Australian Natural Science Collections***

ABRS Original survey 2003

ABRS Supplementary questions 2006

CHAH Resources of Australian Herbaria  
(<http://www.chah.gov.au/chah/resources>) accessed 2006

## Summary

The following information has been derived from a number of taxonomic capacity surveys including those mentioned above, and data and results related to the reports by W.D.L. Ride and Alison McCusker (*The extent and nature of programs in biological survey conducted primarily by State museums and herbaria*, Australian Biological Resources Study 1973–78, Australian Government Publishing Service 1978) and B.J. Richardson and A.M. McKenzie (Australia's Biological Collections And Those Who Use Them, *Australian Biologist* 5(1): 19–30, 1992). Unless mentioned otherwise the information that follows relates to the 2003 survey results.

- In 2003 66% of the taxonomic workforce had curatorial/taxonomic work as their major responsibility. The greatest number (24%) of respondents spent 0–10% of their time on taxonomy or curatorial duties, while the second highest number (17%) spent over 90% of their time on these duties.
- Museums, herbaria and universities employed 80% of the taxonomic workforce. Museums were the top employer in both 1991 (31%) and 2003 (35%). In 1991 Universities rated 2nd with 23%, but they dropped to 3rd place (18% in 2003), being replaced by herbaria which rose from 15% in 1991 to 27% in 2003.
- The number of salaried full-time staff (both permanent and temporary) dropped from 73% in 1991 to 54% in 2003 (of these 7% were temporary employees in 2003). The number of full-time employees funded by grants doubled from 4% in 1991 to 8% in 2003. Between 1991 and 2003 the number of part-time staff trebled from 3% to 9% and the number of taxonomic 'students/others' increased from 4% in 1991 to 9% in 2003.
- A comparison between a subset of 21 herbaria and museums in 1991 and 2006 indicated there had been a decrease in the number of scientific taxonomic staff at these institutions from c. 170 to 145, whereas the number of technical staff increased from c. 106 to 197.
- A comparison between a subset of 13 herbaria and museums in 1975, 1991 and 2006 indicated that in 1975 there had been 122 scientific taxonomists, a rise to 139.2 in 1991 and then a drop to 124.95 in 2006. In 1975 there were 37 honorary staff and this had grown to 85.2 in 2006.
- About 74% of respondents indicated it was likely they would continue with a career of taxonomy, with the highest number being in the 55–59 age group. Over 50% of all age groups (except the 25–29 age group) thought they would continue with taxonomy.
- Grant funding supported almost half (47%) of all field-work days. The proportion of unfunded field-work days (26%) was very similar to the number funded by institutions (27%). In 1989/90 full-time staff performed a greater percentage of the field-work compared to 2001/02.
- In both 2003 and 1991 the most taxonomic task time was spent on research for the institution (15–17%). In 1991 the next most time-consuming task was processing field collections (c. 7%), but in 2003 it was administration (c. 11%).

- The groups with the most researchers were the Dicotyledons (c. 40 people) then the insects (c. 25 people). No researchers were recorded as working on the Cephalocordates, Hemichordates, Monotremes, or Other Minor Acoelomates.
- The majority of respondents indicated that more technical support staff would increase their taxonomic productivity. The majority of people in age groups that spent most time on administration spent less time on research in their organisation, and vice-versa. More field-work and more post-doctoral fellowships were rated as the next most important factors for increasing the respondents taxonomic productivity. However more post-doctoral fellowships was not considered important by just over 1/3 of the respondents (mainly in the 35–39 and 50 plus age groups).
- Lack of career opportunities, ability to attract funding, limited opportunities for young people and lack of security of tenure were considered to be major issues for the taxonomic workforce.
- The highest percentage of the taxonomic workforce was in the 40–44 age group, followed by the 45–49 age group when honorary staff were excluded. However, including honorary staff resulted in the over 60 age group being the second highest group. In 2003 there was a marked decrease in the number of employees aged 55–59 compared to 1991. There was also a slight increase in employees aged 20–24 and 25–29 compared to 1991. The highest number of full-time permanent employees was in the 45–49 age group in 1991, but this had aged to those 50–59 years old in 2003.
- In 2003 the number of men equalled or exceeded women in each age category, and overall was approximately twice the number of women in the taxonomic workforce. In 1991 the number of men was approximately triple the number of women in the taxonomic workforce.

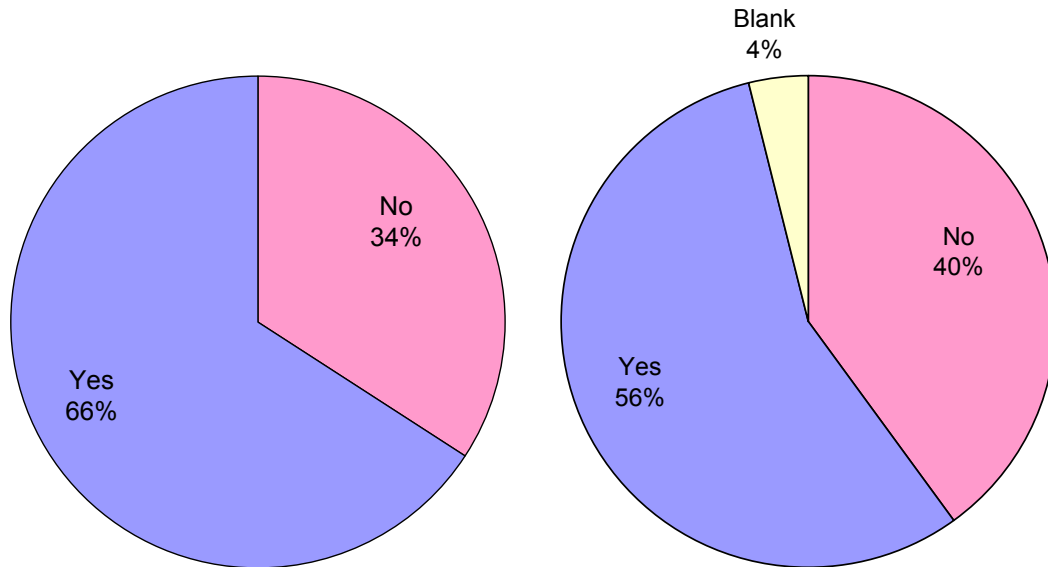
## *Part A*

### *Survey of Taxonomic Workforce*

#### **Question 1a**

**Is curatorial and/or taxonomic work your major responsibility in your organisation?**

Of the taxonomic workforce 66% had curatorial/taxonomic work as the major responsibility, while 34% did not.



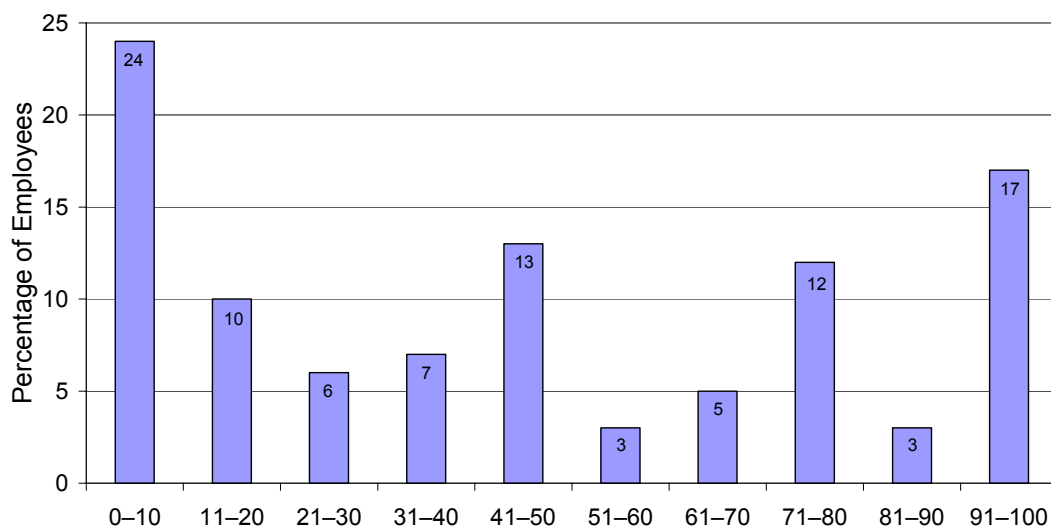
2003—Is curatorial and/or taxonomic work your major responsibility in your organisation?

1991—Is curatorial and/or taxonomic work your major responsibility in your organisation?

#### **Question 1b**

**What is the percentage of work time spent on taxonomy or curatorial duties?**

Nearly one quarter of the taxonomic workforce spent 10% or less of their time on taxonomy or curatorial duties. Just under one fifth spent over 90% of their time on these duties. Employees spending 50% or less of their time on taxonomic duties accounted for nearly three fifths of the workforce, with two fifths spending more than 50% of their time on taxonomic work.

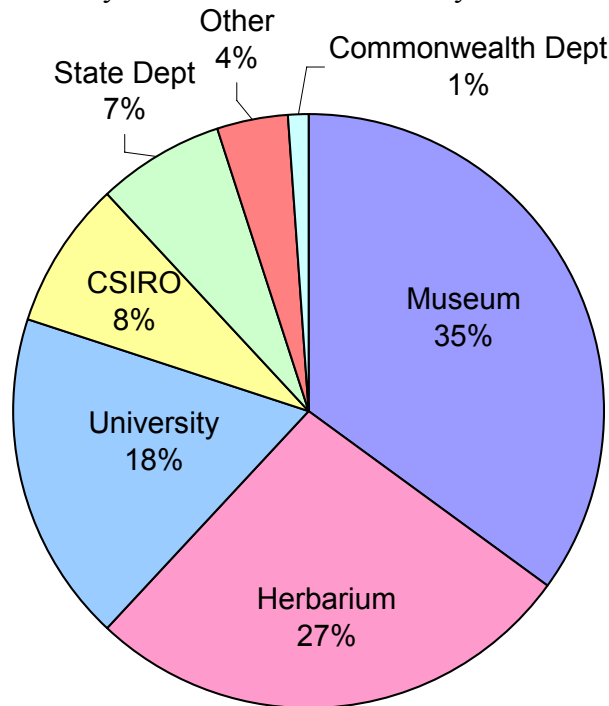


2003—What is the percentage of work time spent on taxonomy or curatorial duties?

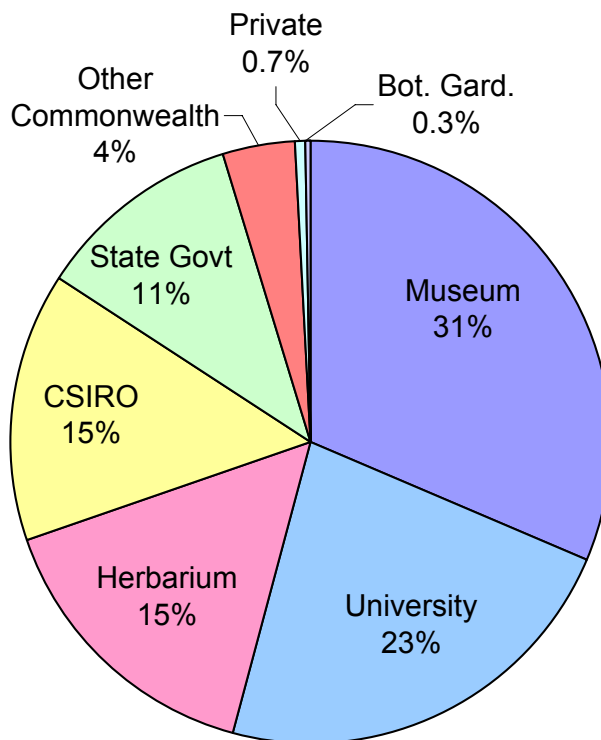
### Question 2a

#### Please identify the type of organisation where you currently carry out your curatorial or taxonomic work?

Museums (35%) and Herbaria (27%) accounted for organisations carrying out the majority of taxonomic work, followed by Universities (18%). Together these groupings accounted for 80% of all taxonomic work. CSIRO and State Departments accounted for 8% and 7% of taxonomic work respectively. The Commonwealth employed few taxonomists directly, with only 1% recorded in this survey.



2003—The type of organisation where you carry out your work



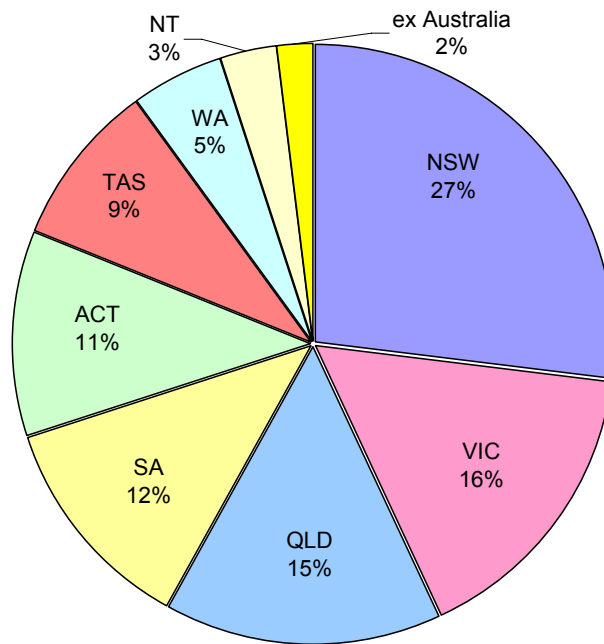
1991—The type of organisation where you carry out your work

In both 1991 and 2003 Museums were cited as the largest employer of taxonomists. Universities were the second most common organisation in 1991 (23%), dropping to third (17%) by 2003. Herbaria moved from third (15%) in 1991 to second (27%) in 2003. CSIRO was cited by 15% of respondents in 1991, but this had dropped to 8% in 2003, in both years it ranked as the fourth most commonly cited organisation. State Government ranked fifth in both years, but dropped from 11% in 1991 to 7% in 2003.

### Question 2b

**Please identify the location of the organisation where you currently carry out your curatorial or taxonomic work?**

Taxonomic institutions based in New South Wales were cited most commonly (27%), with Victoria, Queensland, South Australia, ACT and Tasmania cited between 9% and 16%. Western Australia and Northern Territory were cited by less than 5% of respondents.

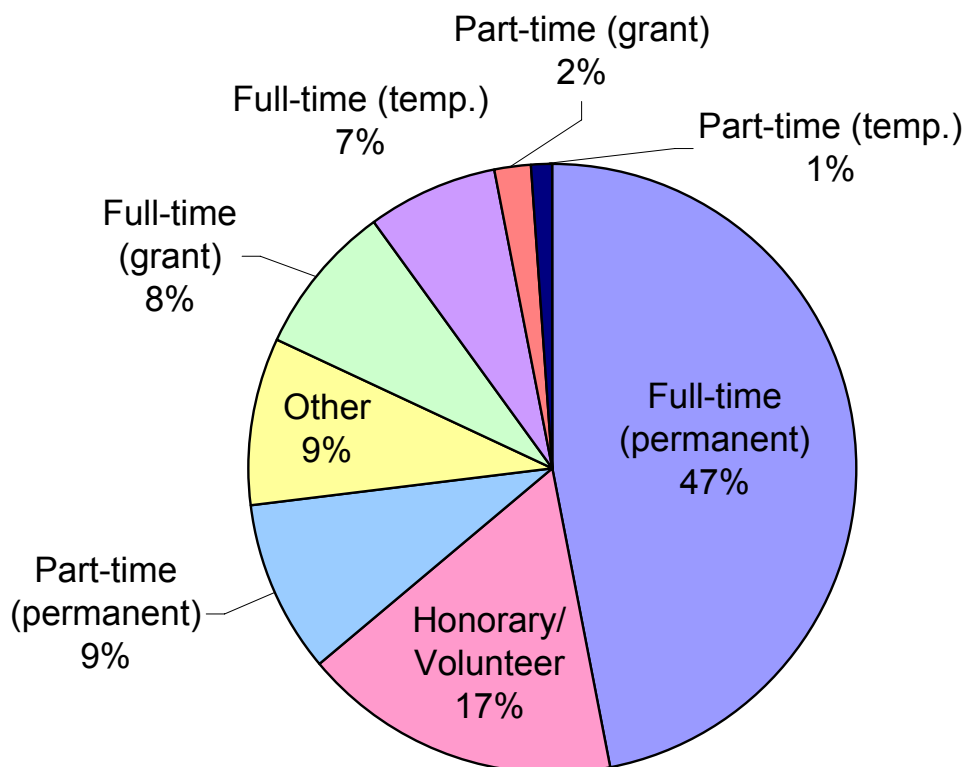


2003—The location of the organisation where you work

**Question 3****What is your employment status at this organisation?**

In 2003 just under 50% of taxonomic staff were employed on a permanent, full-time basis. This was the largest component of the workforce and was followed by non-salaried personnel such as volunteers and honorary staff (17%). Temporary staff (full-time and part-time) made up 18% of the workforce. About 9% indicated their employment status was in the 'other' category which comprised mostly PhD students. The smallest employment category was part-time temporary employees (3%).

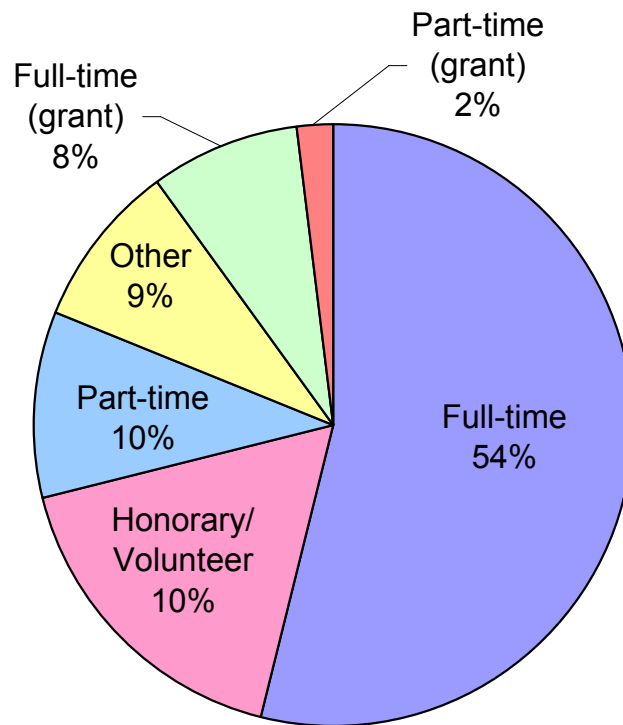
Grant funding accounted for 10% of the workforce, with 8% working full-time and 2% part-time.



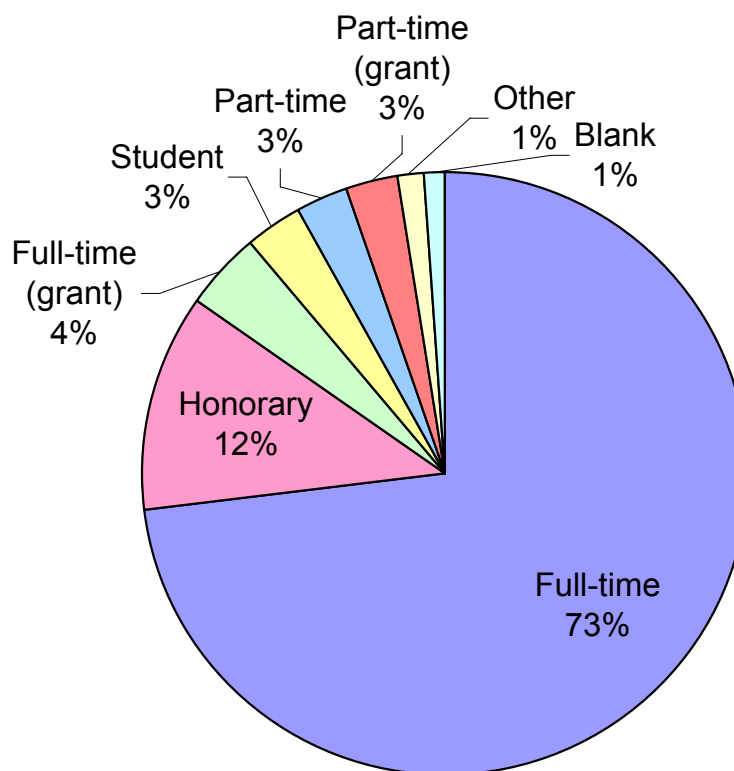
2003—What is your employment status at this organisation?

In the following charts to make the 2003 and 1991 data more comparable the 2003 categories of full-time permanent and full-time temporary (excluding grants) have been combined into one full-time category. The same has been done for the 2003 part-time staff.

In 1991 salaried full-time employees made up 73% of the workforce, in 2003 this had dropped to 54%. Honorary staff or volunteers comprised 12% of the workforce in 1991 and 17% in 2003. The number of full-time employees funded by grants doubled from 4% in 1991 to 8% in 2003, whereas there was little change (a drop of 1%) in part-time staff funded by grants. Part-time staff accounted for 3% of the workforce in 1991, and by 2003 this had more than trebled to 10%. Students and others accounted for 4% in 1991 and this had risen to 9% by 2003.



2003—Employment status at this organisation?



1991—Employment status at this organisation?

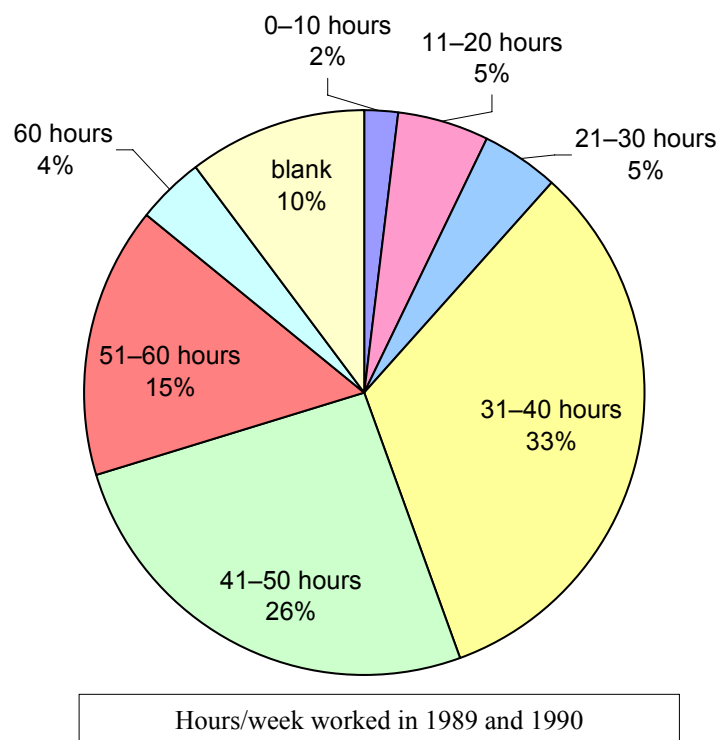
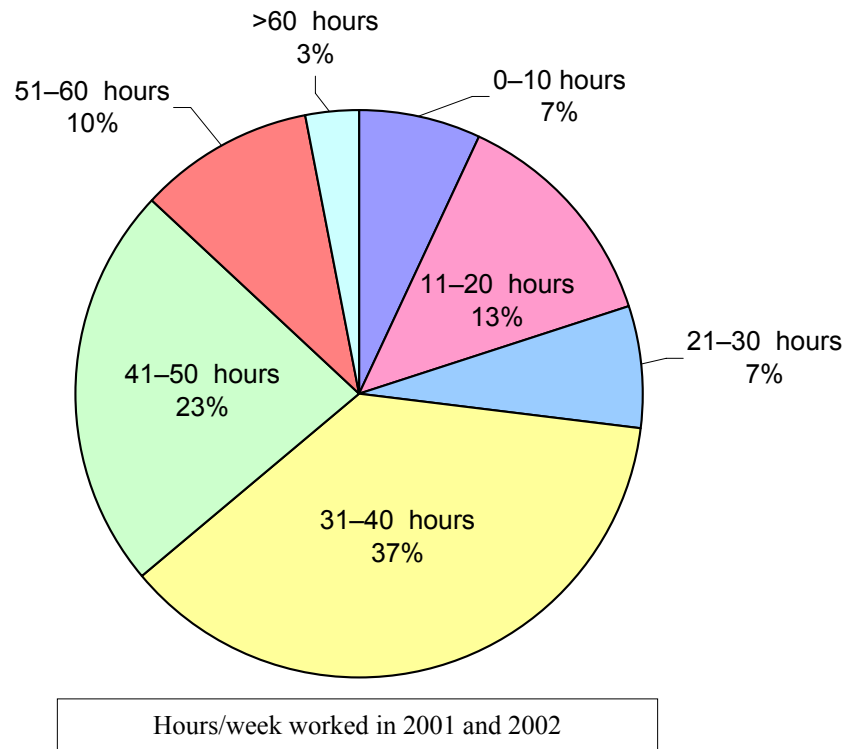


#### Question 4

#### In your position how many hours per week would you have worked on average during 2001 and 2002?

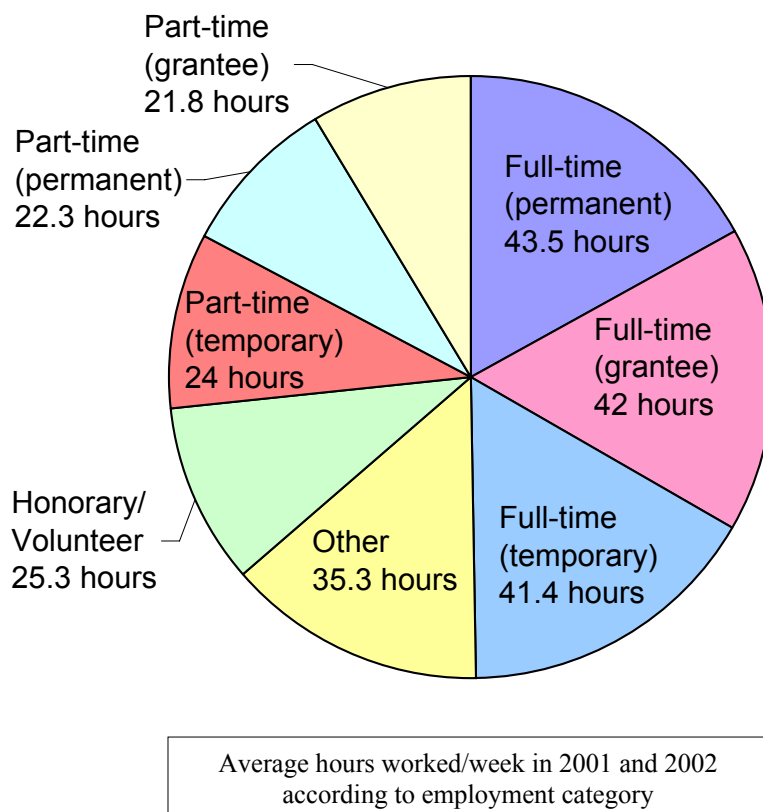
The average hours worked by permanent, full-time staff was 43.5 hours per week, and by full-time grantees was 42 hours per week. The survey showed 36% of taxonomic staff worked more than 40 hours per week.

Staff working 31–40 hours per week accounted for 37% of the workforce and was the largest individual sector, with 41–50 hours second with 23% of staff. The following charts show the relative percentage of staff working from 0 to over 60 hours per week.



As in 2003, the most common average hours worked per week in 1991 were 31–40, followed by 41–50. In 2003 the third category was 11–20 hours (reflecting the greater number of part-time staff—13% in 2003 compared to 5% in 1991). However, in 1991 the third category had been 51–60 hours (15% in 1991 compared to 10% in 2003).

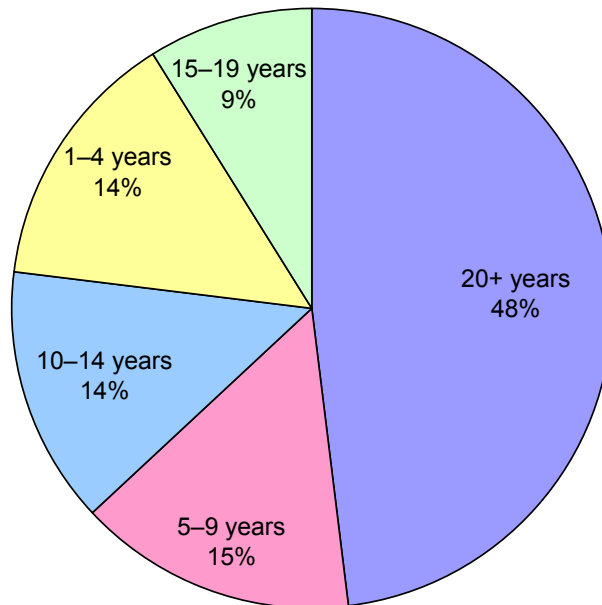
The following chart shows the average hours worked per week in 2001/2002 according to the different employment categories (The ‘Other’ category comprised mainly PhD students).



### Question 5

#### How long have you been working in the field of taxonomy?

As the question did not extend beyond 20 years of experience it failed to explore the extreme professional longevity of taxonomists. In 2003 almost half the respondents (48%) had been working 20+ years. About the same number of people (14–15%) had worked for 1–4, 5–9 and 10–14 years in taxonomy, and 9% had between 15–19 years experience.



2003—How long have you worked in the field of taxonomy?

### Question 6

#### Do you intend to be working in the field of taxonomy in 12 months time?

Yes: 98%.

No: 2%.

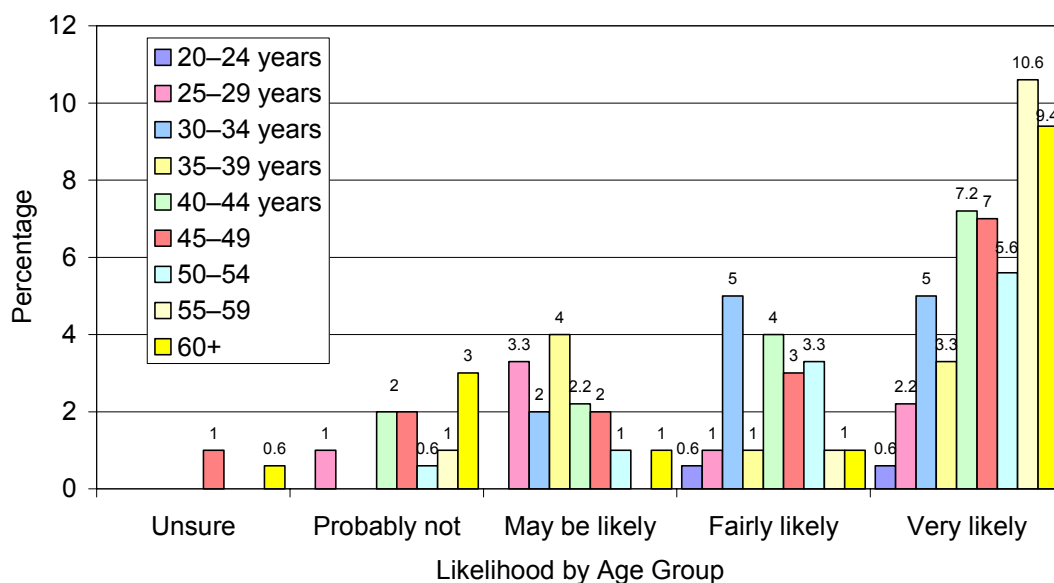
**Question 7****How likely is it that you will continue to build your career in taxonomy?**

In 2003 the greatest percentage of respondents (53%) felt they were very likely to continue to build their career in taxonomy. Another 21% thought it was fairly likely they would continue with taxonomy. This brought to 74% those most likely to continue with a taxonomic career. There were 16% who thought they only may remain in taxonomy and 9% who felt they would probably not build a career in taxonomy.

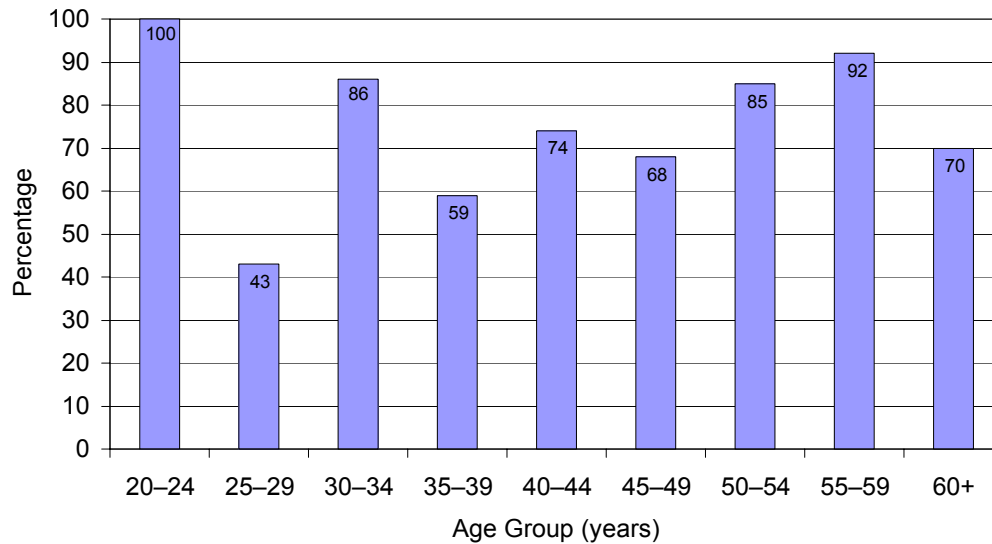
Very likely	53%	} 74%	} 89%
Fairly likely	21%		
May be likely	16%		
Probably not	9%		
Unsure	2%		

2003—Likelihood of continuing  
with taxonomy

Of the c. 74% who indicated they were likely to continue with a career of taxonomy the highest percentage was in the 55–59 age group. Less than 50% of the 25–29 age group thought it was likely they would continue with a taxonomic career, while over 50% of all other age group categories thought they were likely to continue with taxonomy. Within the category of people who thought they would ‘probably not’ continue with taxonomy the 60+ age group had the highest representation (c. 3% of the survey group) followed by the 40–44 and 45–49 age groups (each with c. 2% of the survey group).



2003—Likelihood of continuing with taxonomy by age group

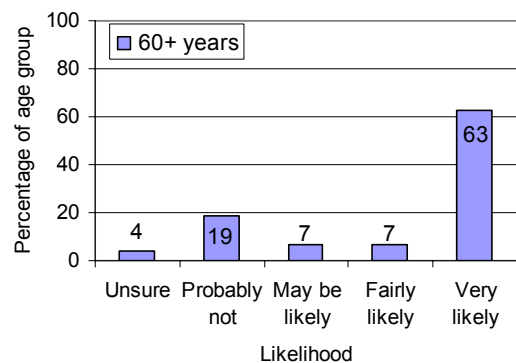
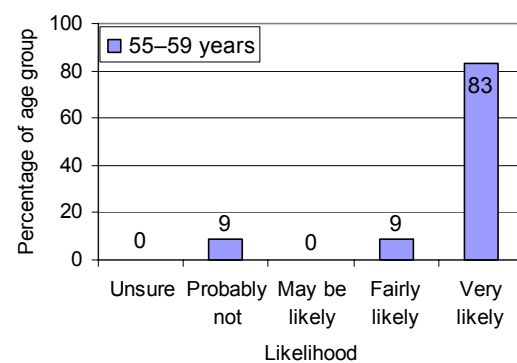
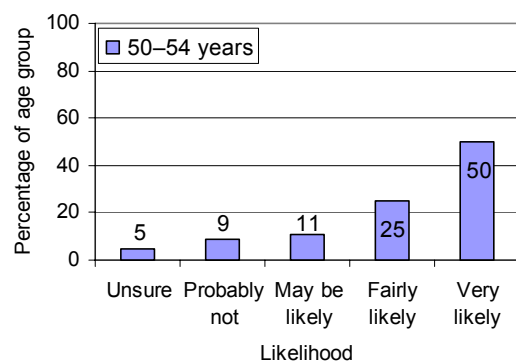
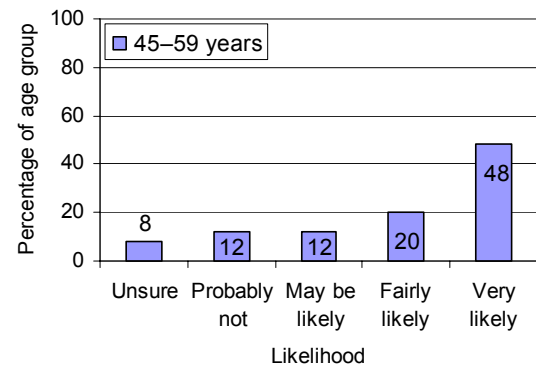
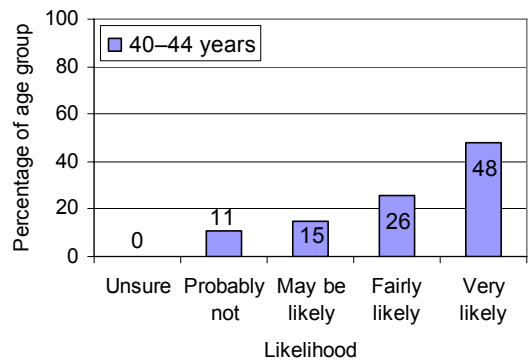
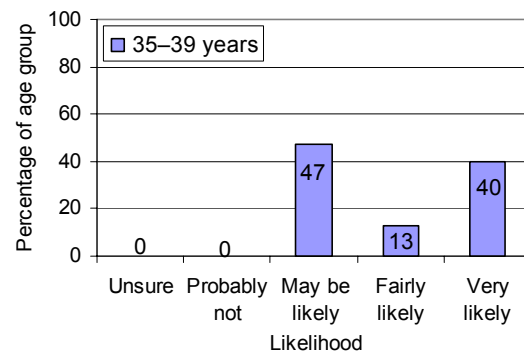
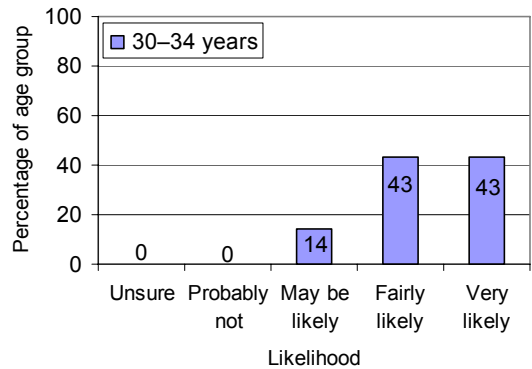
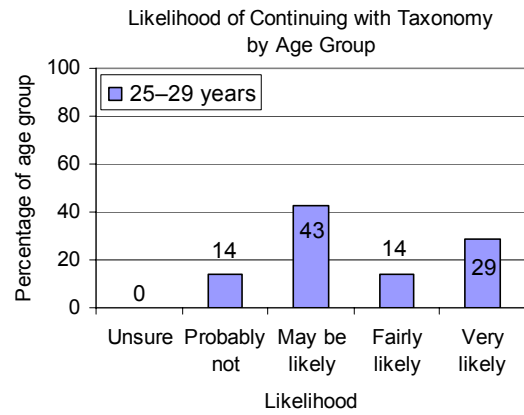
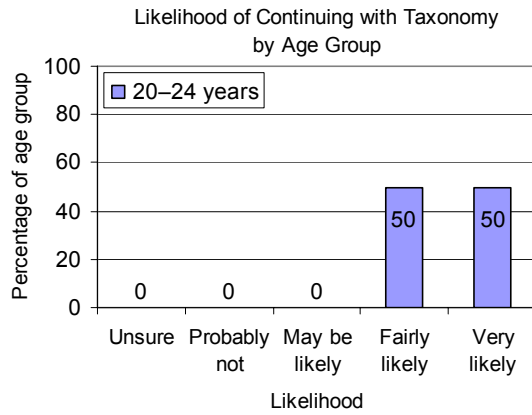


2003—Percentage 'very likely' and 'fairly likely' to continue with taxonomy within each age group

Of the over 60 age group 70% said it was likely they would continue with a taxonomic career. The highest number of respondents who would probably not continue with taxonomy was in the over 60s group and this was understood to be due to retirement from the workforce rather than to a change in career direction.

The 25–29 age group had the most even representation across all 'likelihood' categories. The largest number of people in the survey of the taxonomic workforce were aged between 35 and 54 (together comprising 49% of the workforce).

ABRS—Survey of Australian Taxonomic Capacity 2003/2006



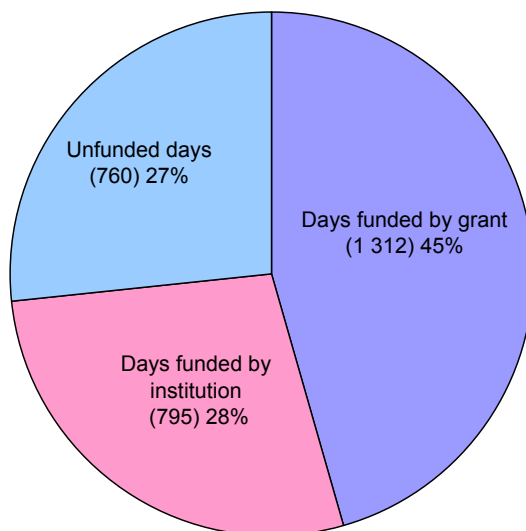
### Question 8

#### How many days of taxonomic field-work have you undertaken in the last two calendar years and how were they funded?

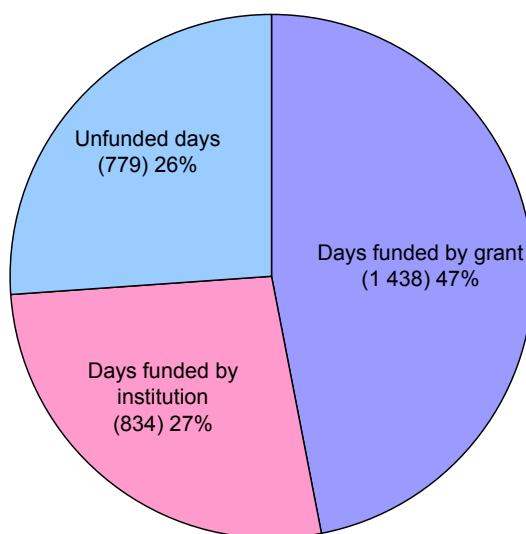
In 2001 there were c. 2 867 days of field-work undertaken. In 2002 there were 3 051 days of field-work undertaken. This is less than half the amount of field-work days undertaken in the 1989/90 period.

The proportion of field-work days supported by institutions and grants was consistent over the two years surveyed with the proportion of field-work days supported by grants being approximately half of all days (47%) spent in the field. The proportion of unfunded field-work days (26%) is very similar to the number funded by institutions (27%).

The maximum number of days/year claimed to be spent in the field by any one worker was 144 (72 of which were without funding). The number of respondents spending more than 20 days in the field per year was highest under grant funding (21–25 people), followed by institutional funding (11 people) and then unfunded field trips (5–6 people).

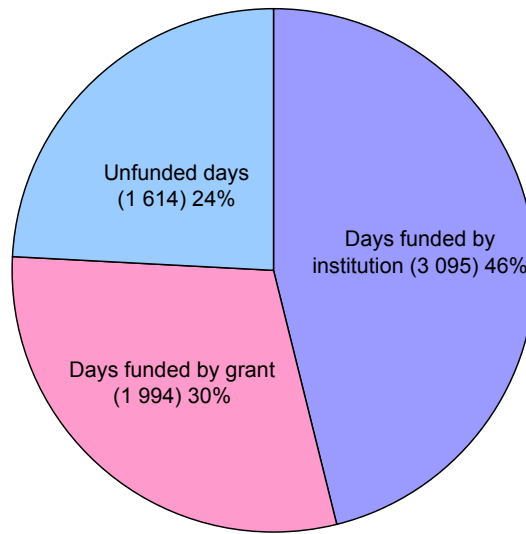


2001—Days of taxonomic field-work

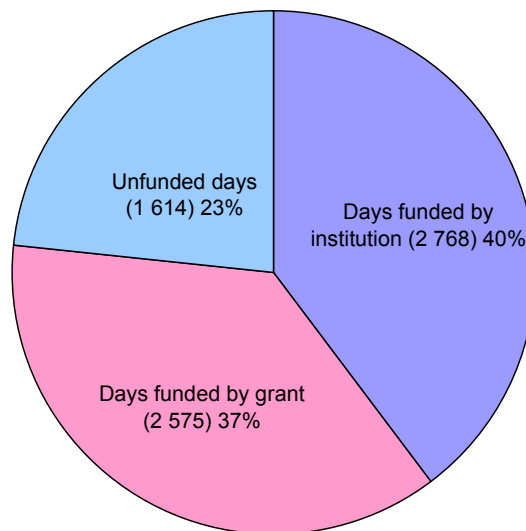


2002—Days of taxonomic field-work

The following two charts have been derived from the 1991 taxonomic capacity survey for comparison with the 2003 data. In 1989 there were 6 703 days of field-work undertaken. In 1990 there were 6 957 days of field-work undertaken.



1989—Days of taxonomic field-work

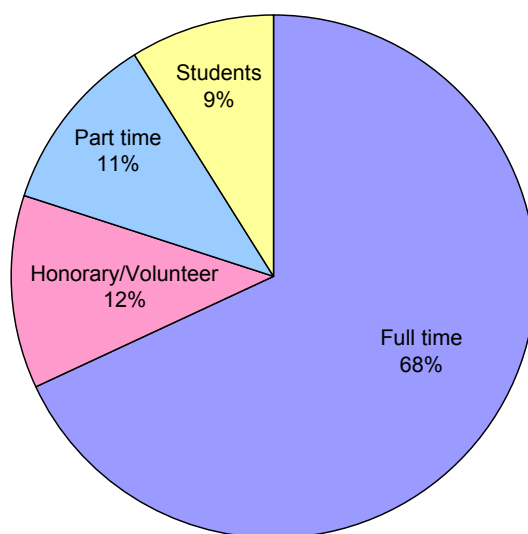


1990—Days of taxonomic field-work

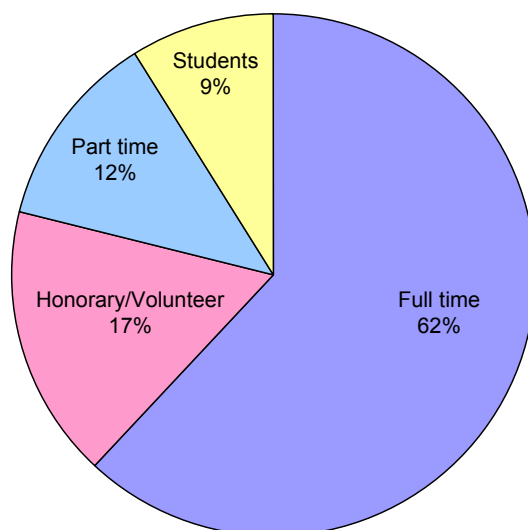
The percentage of the workforce in each category (i.e. the greatest percentage of respondents were engaged in full-time employment) is roughly mirrored in the percentage of employees engaged in field-work (averaged over the two years). In 2001/02 the majority of part-time and honorary employees did either no field-work or less than 11 days per year; however c. 1/3 of both were involved in over 11 days of field trips per year. Over half of the full-time staff were involved in 1–20 days of field trips per year. Students were involved in the greatest range of field trip durations. Full-time staff had the most involvement in field trips of over 60 days with eight people (however by employment category this was only 7% of full-time employees). Two students were involved in field trips of over 60 days and this was 17% of the students, rating students as having the highest percentage participation of all categories in the longest field trips.



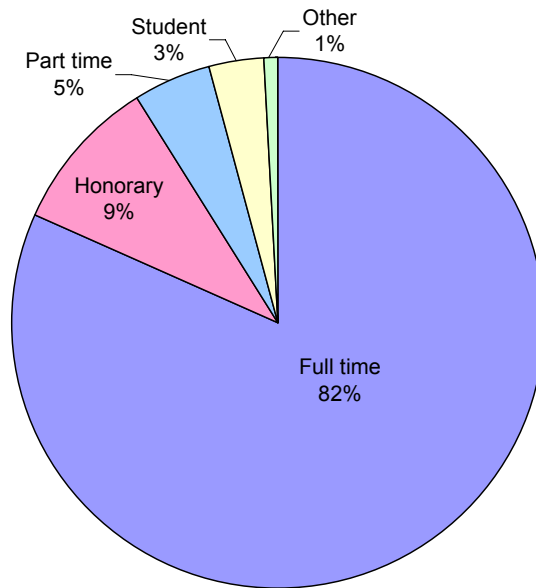
In both the 1989/90 and 2001/02 data the percentage of the workforce in each category roughly mirrored the percentage of field-work done by each category. In 1989/90 full-time staff performed a greater percentage of the field-work compared to 2001/02.



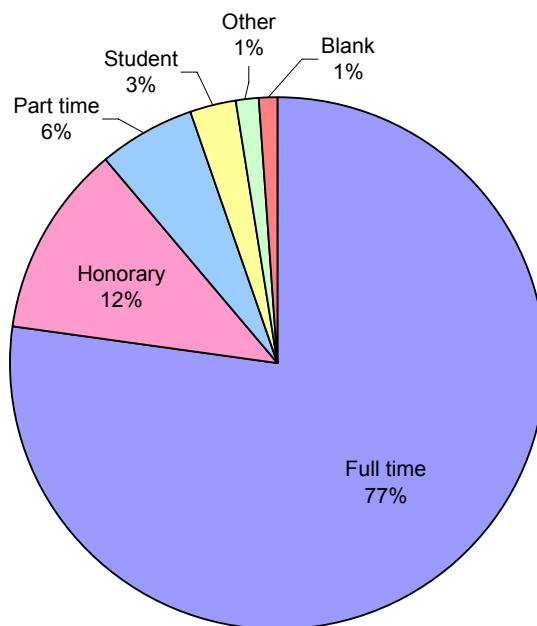
2003—Percentage field-work days by employment category



2003—Percentage taxonomic workforce by employment category



1991—Percentage field-work days by employment category

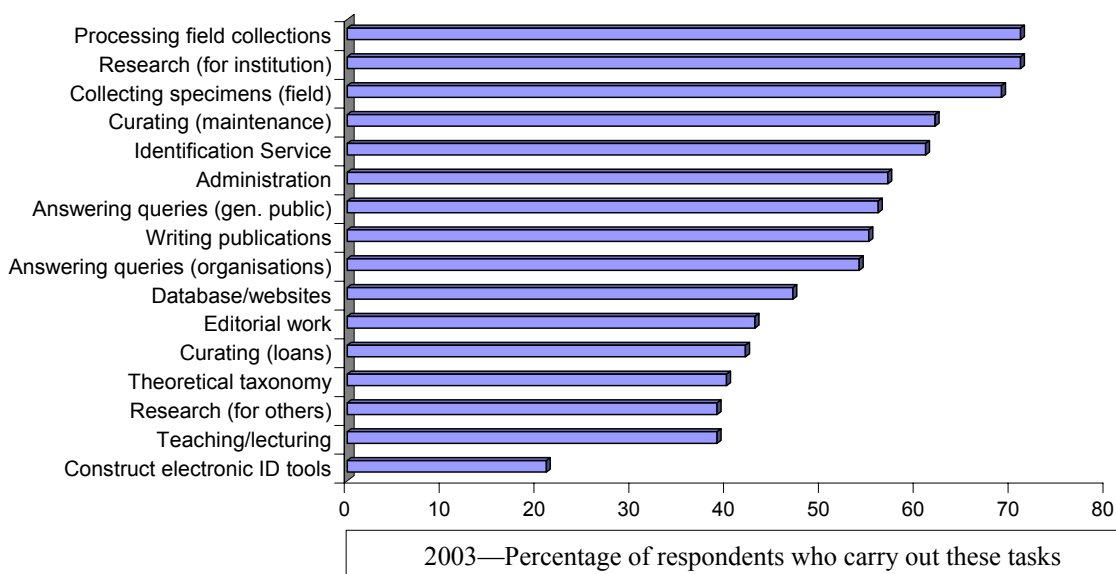
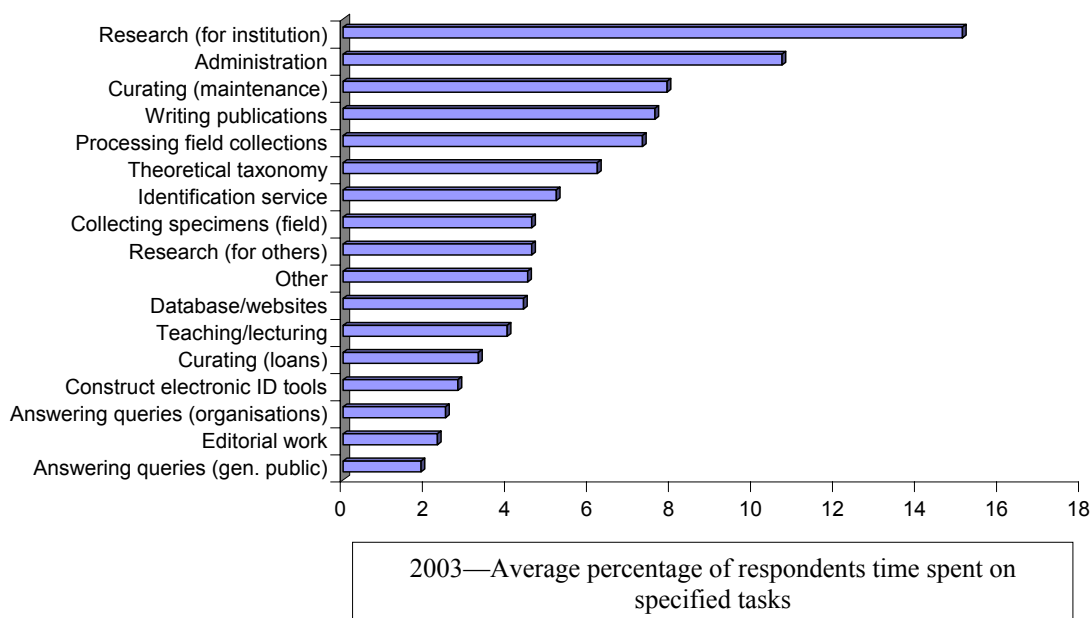


1991—Percentage taxonomic workforce by employment category

**Question 9**

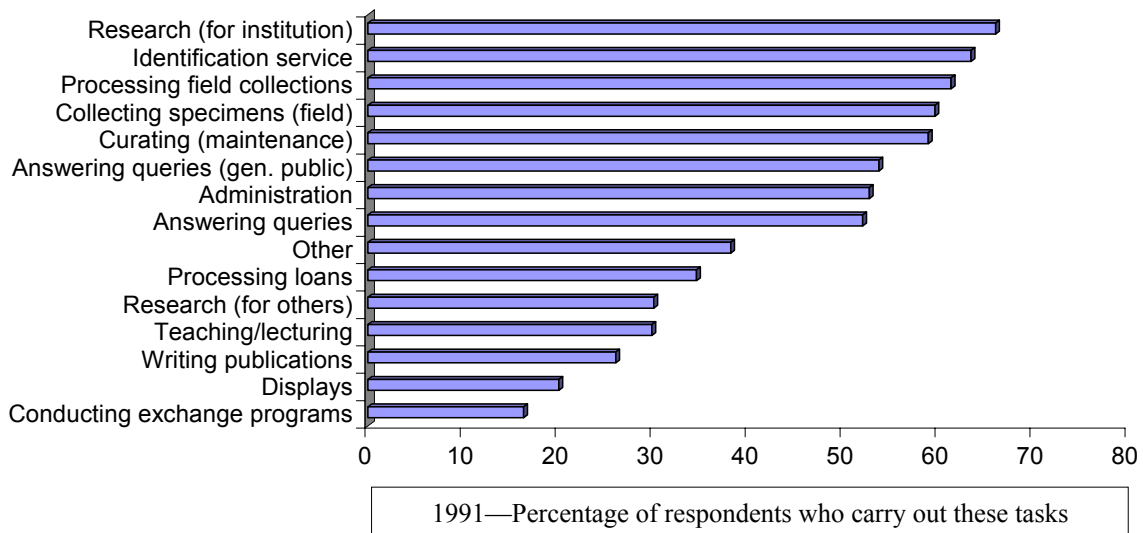
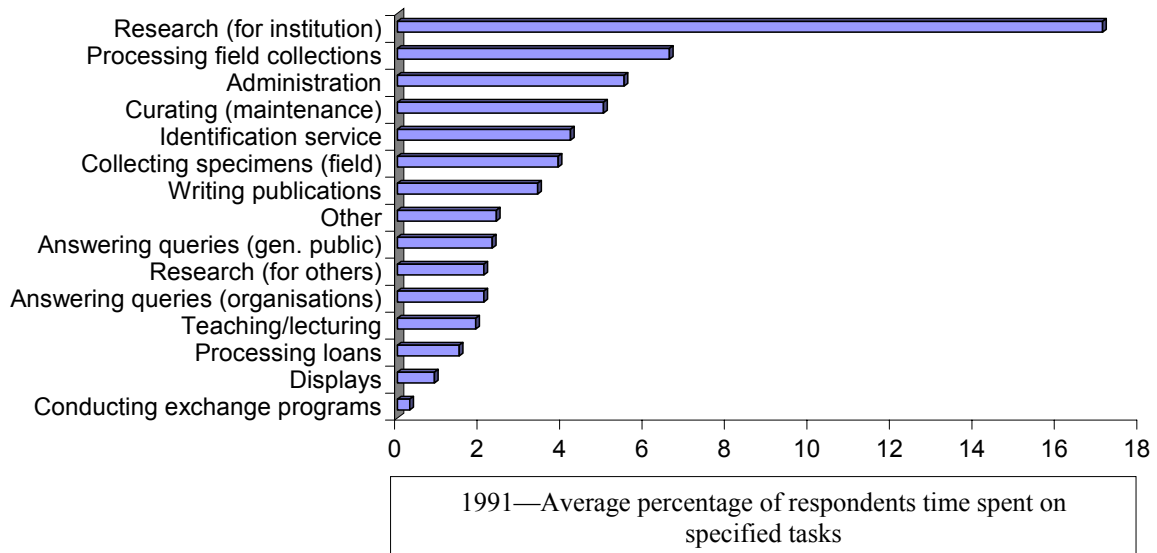
**Thinking about your job over the last twelve months, could you estimate what percentage of your full-time work was devoted to the following tasks?**

The amount of time spent on the specified tasks varied considerably from one taxonomist to another. The highest percentage of time reported by an individual was 100% on Institutional Research, followed by 90% for Administration and 85% for Specialist Identification and Theoretical Taxonomy. The highest average task times were Institutional Research (15.1%) and Administration (10.7%). Curating, Writing Publications and Processing Field Collections all occupied on average between 7.3 and 7.9% of time, followed by Theoretical Taxonomy (6.2%) and Identification Services (5.2%). The next five tasks (see table) all occupied between 4 and 4.6% of the averaged respondents time. The smallest averaged percentage of time was spent on Answering General Public Enquiries (1.9%). Under the 'Other' category respondents included duties such as bibliographic work, Convention on International Trade in Endangered Species (CITES), data analysis, environmental impact statements, field surveys, grant/report writing, non-taxonomic duties, preparing exhibitions, refereeing, supervision of students, training courses.



Of the specified tasks, Research (for institutions) ranked equal highest with Processing Field Collections. Over 50% of respondents were involved in: Processing Field Collections, Research (for institution), Collecting Specimens (field), Curating (maintenance), Identification Services, Administration, Answering Queries, and Writing Publications. Less than 50% of all respondents were involved in Database/Website Development, Editorial Work, Curating (loans), Theoretical Taxonomy, Research (non-institutional), Teaching/lecturing, and lastly Constructing Electronic Identification Tools (21%).

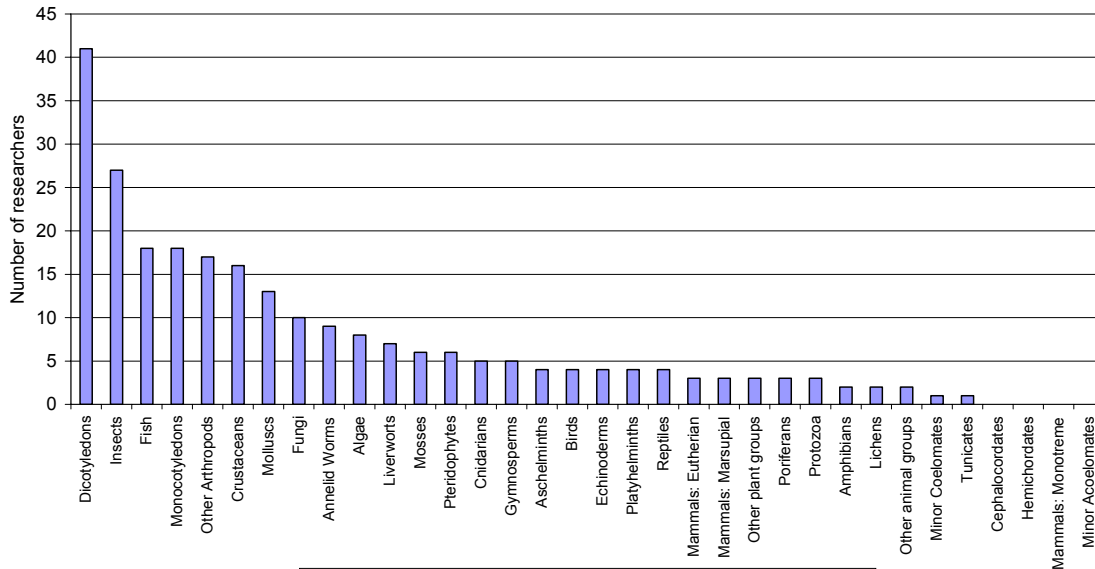
The following charts from the 1991 taxonomic capacity survey have been provided for comparison.



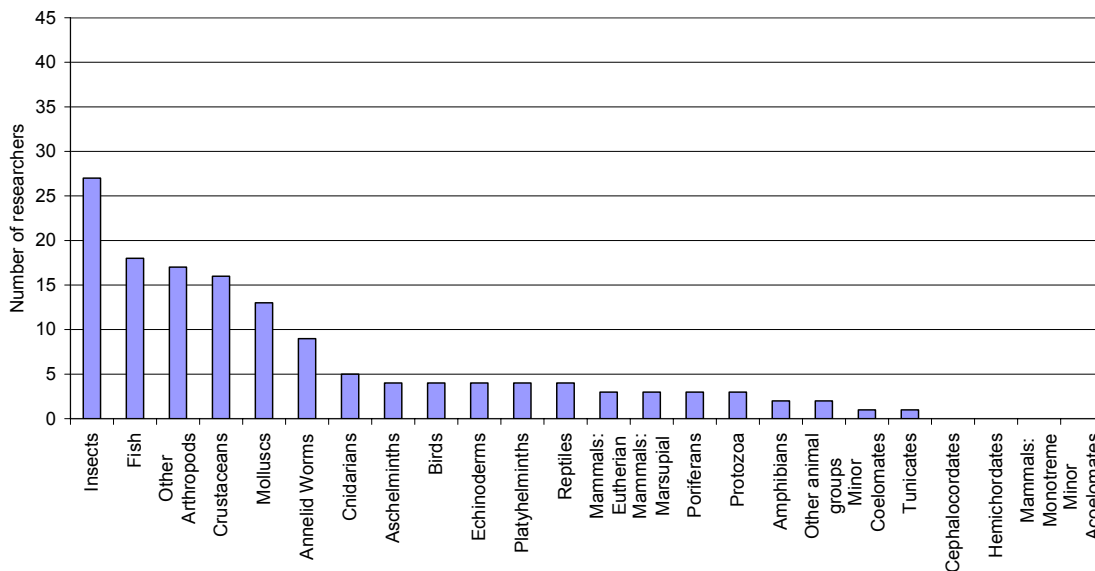
### Question 10

**If you are or have been a practicing taxonomist please indicate on which taxa of Australian living or fossil organisms you conduct or have conducted original taxonomic research**

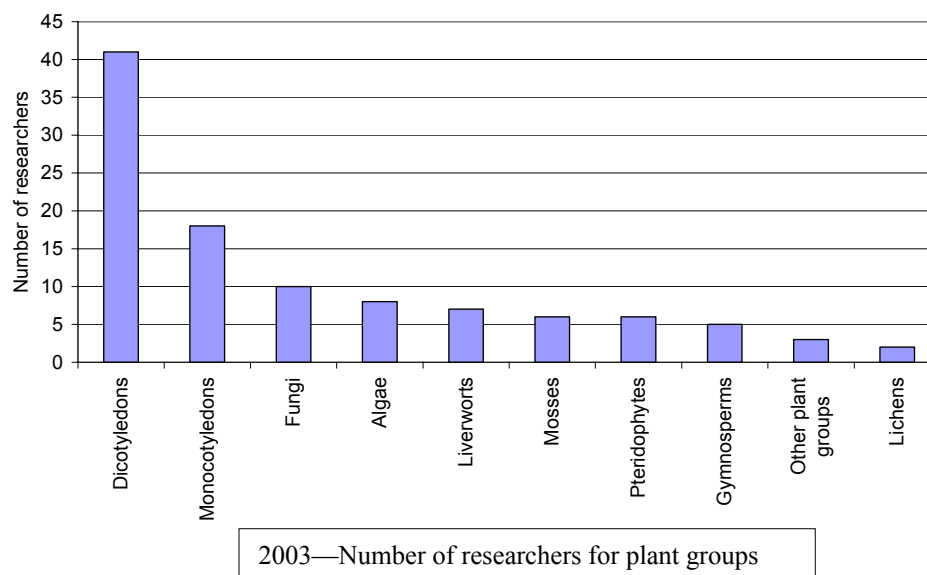
The two groups with the most researchers were the Dicotyledons within the Angiosperms (c. 40) then the Insects (c. 25). Between 10 and 18 researchers worked on each of the Fish, Monocotyledons (within Angiosperms), Other Arthropods, Crustaceans, Molluscs and Fungi. The remaining groups had less than 10 researchers working on them, with no researchers recording they had worked on the Cephalocordates, Hemichordates, Monotremes (within the Mammals) or the group Other Minor Acoelomates.



2003—Number of researchers for all groups



2003—Number of researchers for animal groups



### Question 11

**If your taxonomic research interests are best defined by taxa of rank below order please name them**

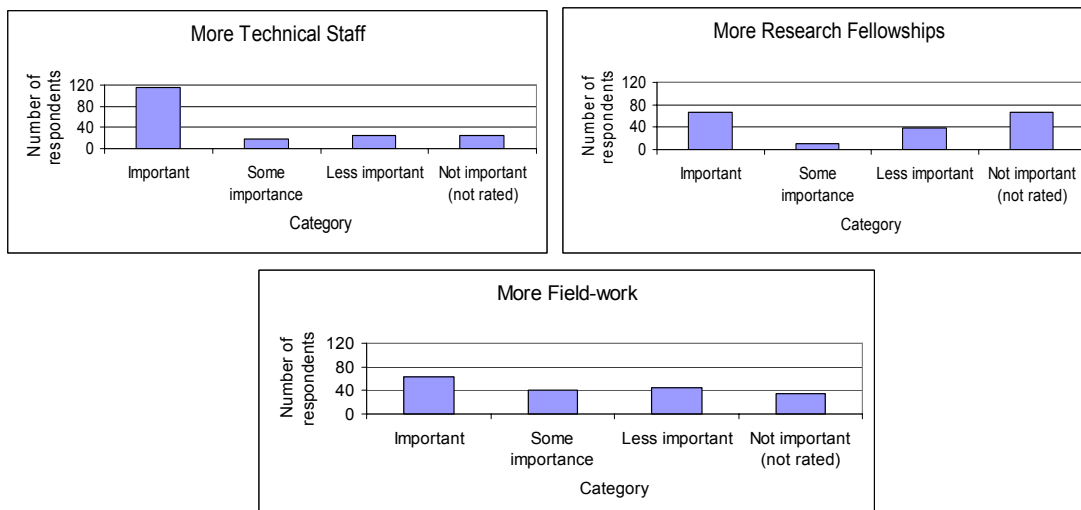
The information from this question has not been included here as it was recorded as free text and the information received was not in standardised categories.

### Question 12

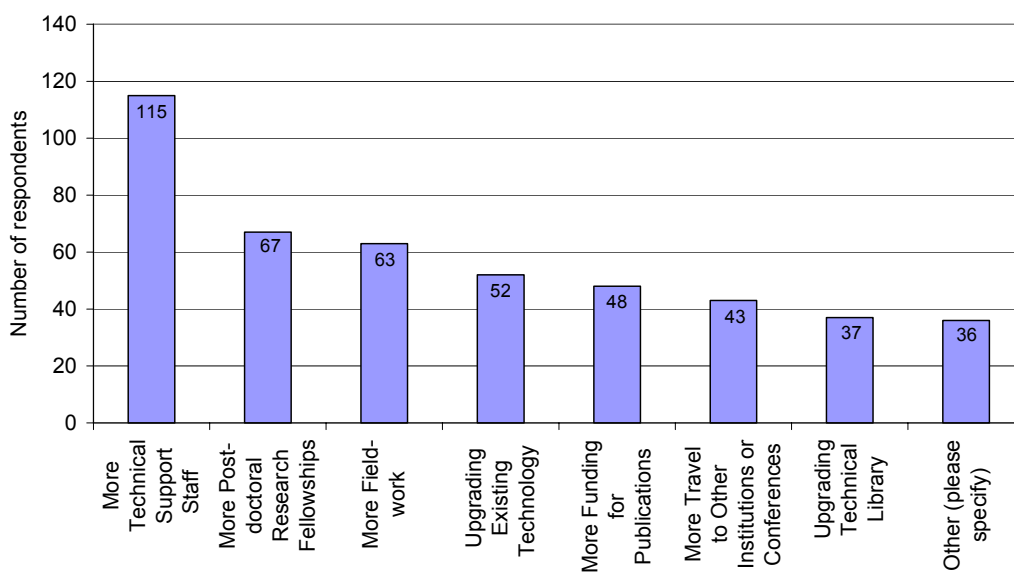
**In order of importance, which of the following would increase your productivity if funding were available**

The clear majority of respondents indicated that More Technical Support Staff would increase their taxonomic productivity. This was the only clear cut response. Following this an increase in the number of Post-doctoral Research Fellowships was considered the second most important factor, however 37% of respondents did not rank it highly as a factor that would increase their taxonomic productivity. Increasing the amount of Field-work was ranked as the third most important factor that would improve their taxonomic productivity, however 19% felt that increasing it would have no effect, and there was a fairly even spread of the remaining respondents who felt increasing the amount of Field-work would be rated between minor and major in importance to increasing their taxonomic productivity.

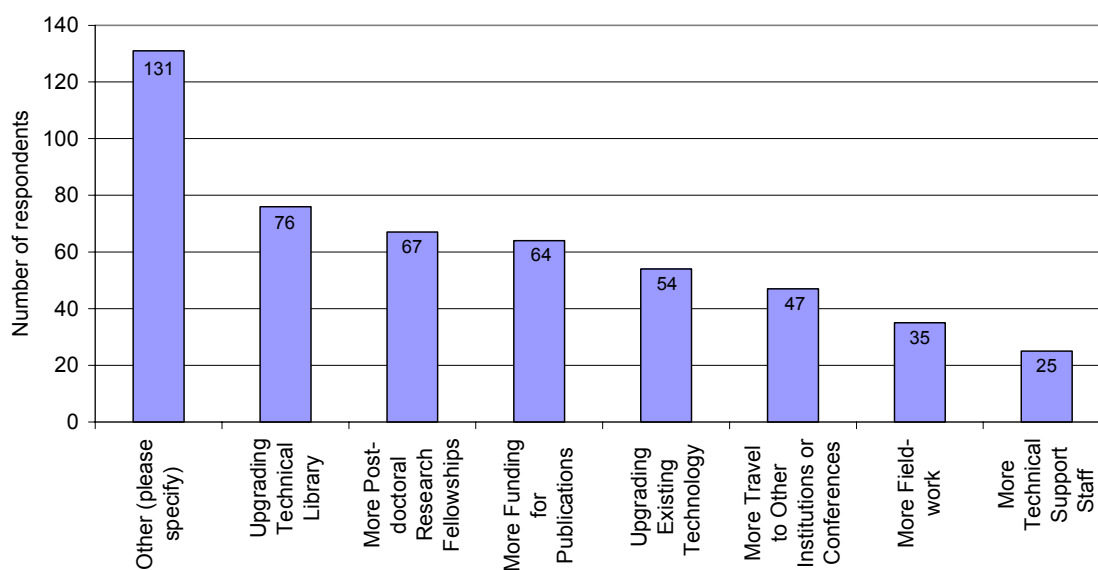
ABRS—Survey of Australian Taxonomic Capacity 2003/2006



2003—The three most important factors for increasing the productivity of the respondent

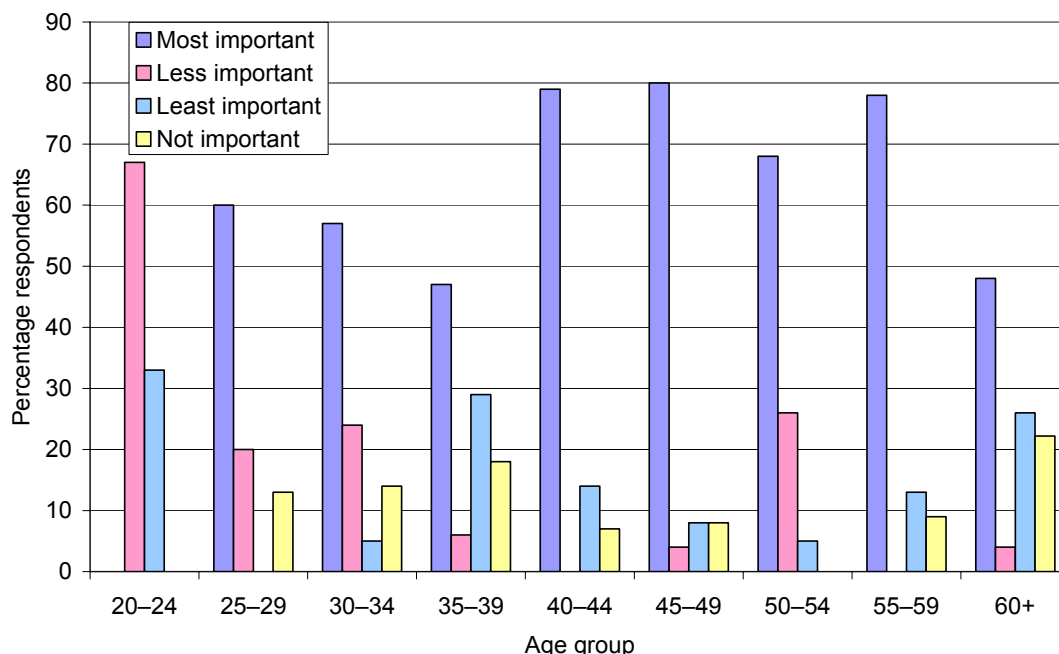


2003—Categories rated as most important for increasing the productivity of the respondent



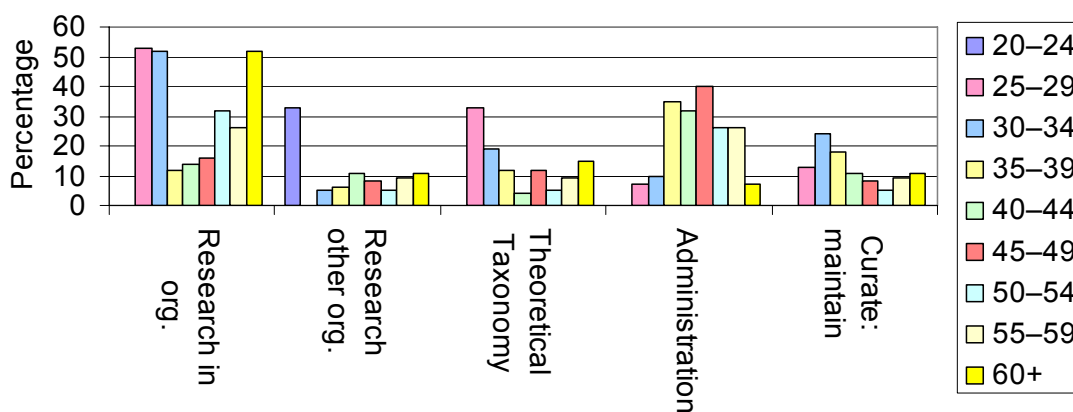
2003—Categories not considered important for increasing the productivity of the respondent

Of the nine age groups, all ranked More Technical Support Staff as the Most Important issue in increasing their taxonomic productivity with the exception of the 20–24 year age group. Between 40–50% of the 25–39, and 60+ age groups ranked it as Most Important, and from 68–80% of the 40–59 age group ranked it as Most Important.



2003—Support by age group for more technical staff

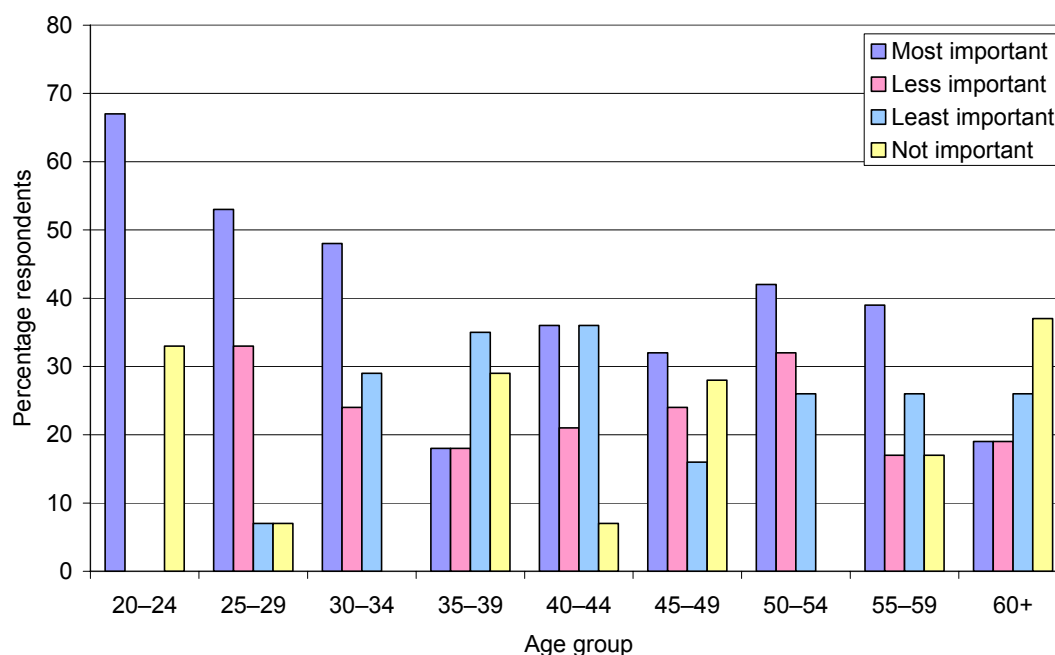
The 40–59 age group who ranked the requirement for More Technical Support Staff most highly appear in the following chart as having a greater percentage of their time dedicated to administration and a relatively small amount to taxonomy, curation and research (both within their own and for other organisations).



2003—Tasks occupying over 20% of the respondents time

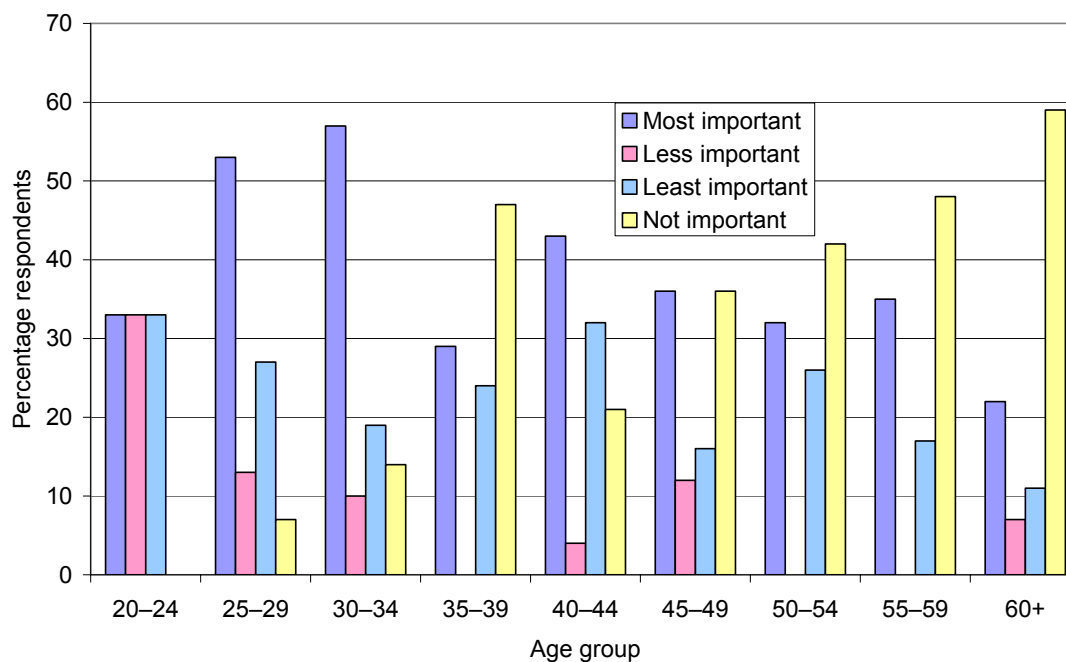
The 20–34 age group felt that increasing Field-work would be an important factor in increasing their taxonomic productivity. All groups felt that increasing Field-work would result in some degree of increased taxonomic productivity, but with much of the 35–60+ age group rating Field-work as having an effect somewhere between low in importance and high in importance. The 20–24, 35–39, 45–49 and 60+ age groups had the highest percentage of people who felt that increasing Field-work was not important in increasing their taxonomic productivity.





2003—Support by age group for more field-work

Over 50% of the 25–34 year age group considered Post-doctoral Research Fellowships to be in the Most Important category in terms of increasing their taxonomic productivity and along with the 20–24 age group they were the most supportive of the fellowships. Over 80% of respondents in the 20–34 age group felt that increasing the fellowships would have an effect on improving their taxonomic productivity. Between 50–80% of the 34–59 age group felt it would have an effect. The 60+ age group was the only group where the greatest percentage (59%) felt that increasing the fellowships would not result in an improvement in their taxonomic productivity.

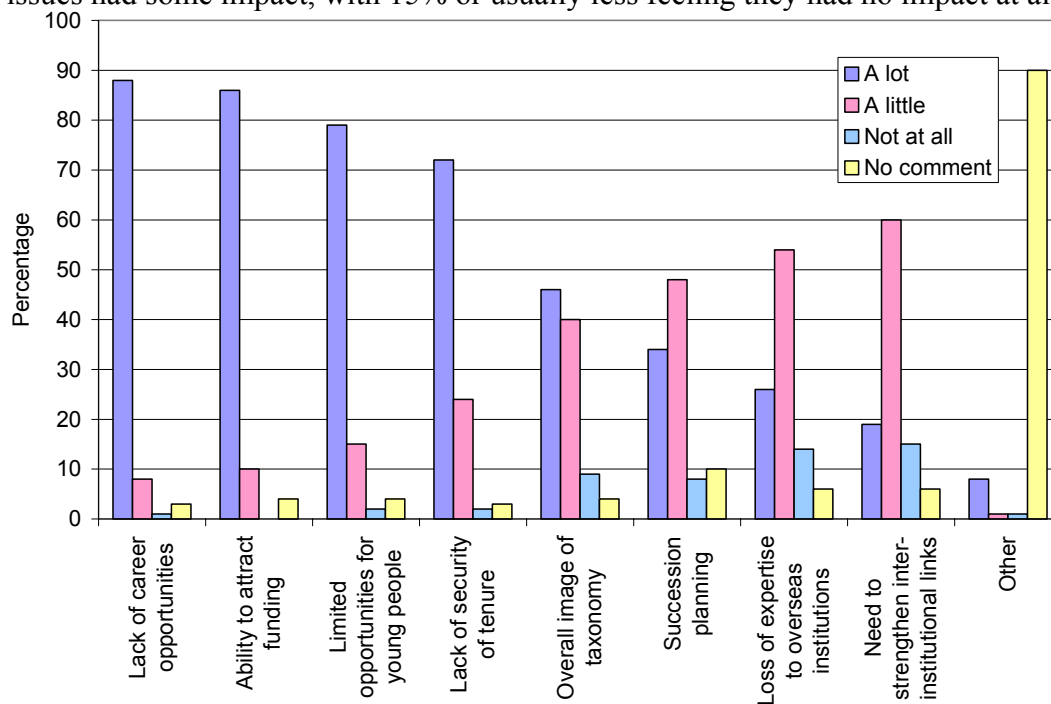


2003—Support by age group for more post-doctoral research fellowships

**Question 13**

**Please indicate how much you think the following costs and opportunities in taxonomy impact on the taxonomic workforce. Do they impact a lot, a little or not at all?**

Over 50% of respondents felt that a lack of career opportunities, the ability to attract funding, limited opportunities for young people and a lack of security of tenure impacted a lot on the taxonomic workforce. There was a fairly clear inverse relationship between issues rated as having ‘a lot’ versus ‘a little’ impact. Most people felt that these issues had some impact, with 15% or usually less feeling they had no impact at all.



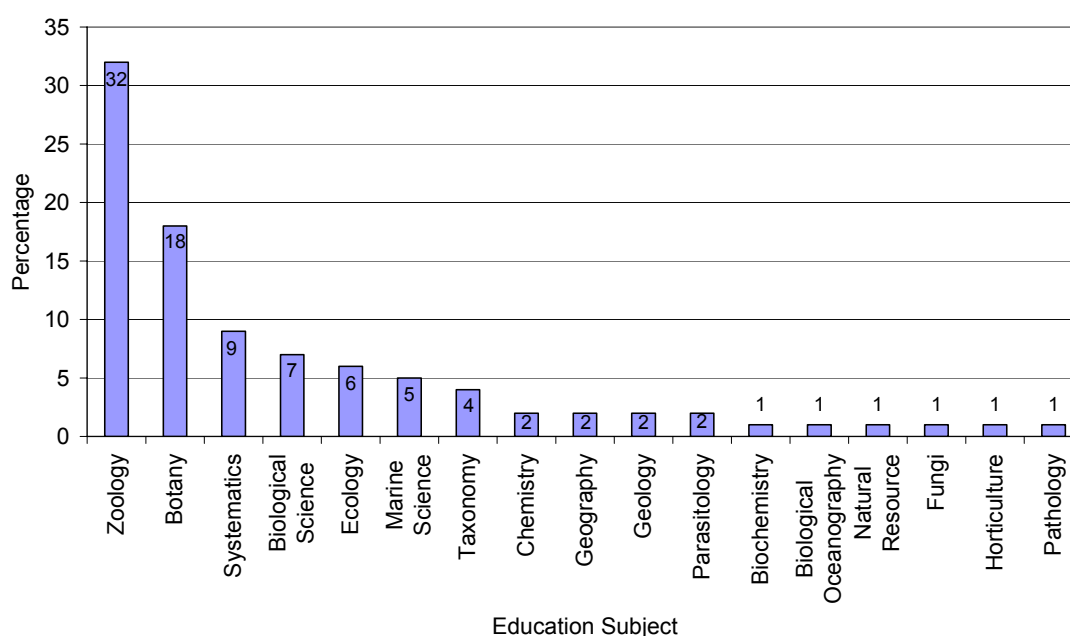
2003—Impact of costs and opportunities on taxonomic workforce

**Question 14a****What was the highest level you achieved in your formal education?**

The highest number of respondents (56%) had completed a Doctorate. This was followed by 21% having an Honours degree, 11% an Undergraduate Degree and 7% a Masters Degree. Diplomas and Higher School Certificates accounted for about 1%. Some of the respondents were in the process of completing higher degrees with about 5% studying for a Doctorate and 1% for Masters.

**Question 14b****In what subject areas did you major?**

Just over 32% of respondents majored in the subject areas of Zoology and 18% majored in Botany. Systematics followed with 9%, then Biological Science (7%), Ecology (6%) and Marine Science (5%). The remaining subjects in the chart had been major subject areas for less than 5% of the respondents. Fourteen other categories were recorded but not charted (below) with 0.4% of respondents majoring in subjects such as Agriculture, Microbiology and Palaeobotany. Also with under 0.4% were subjects such as Engineering, English, Linguistics, Philosophy and Psychology.



2003—In your studies in what subject areas did you major?

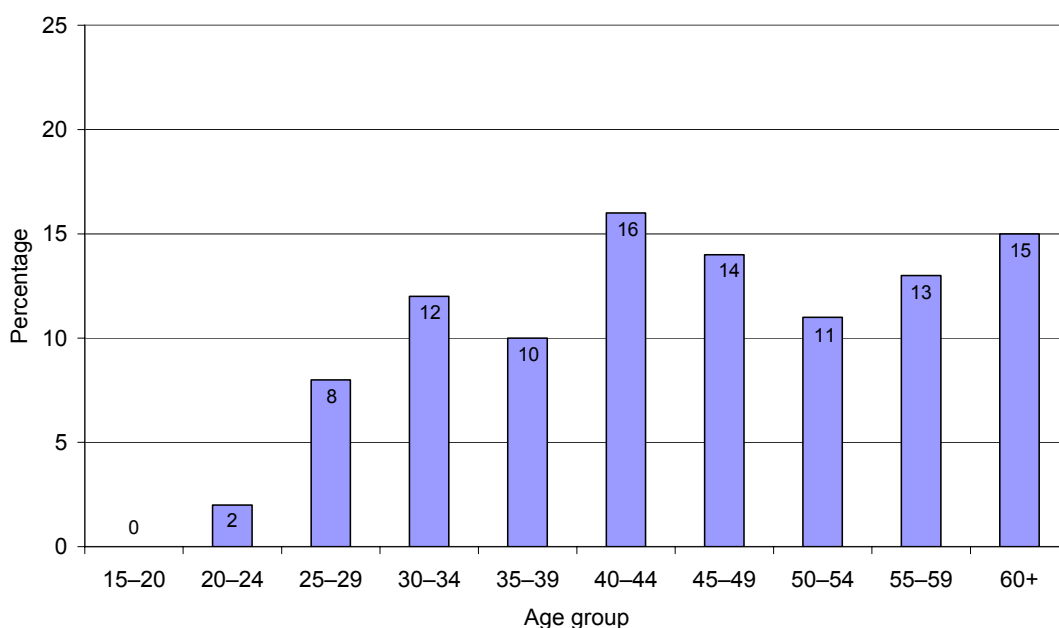
**Question 15****Are you male or female?**

In 2003 the male taxonomic workforce accounted for 67% and the female taxonomic workforce for 33%.

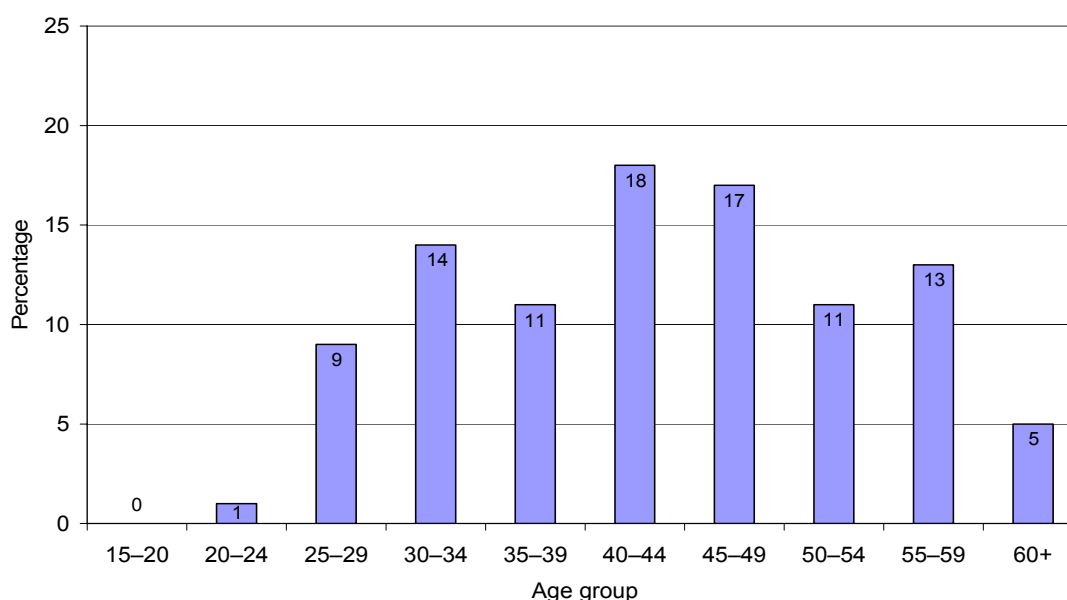
In 1991 the male taxonomic workforce accounted for 76% and female taxonomic workforce for 24%.

**Question 16****Which of the following age categories are you in?**

Excluding the honorary staff, in 2003 there were two age categories that rated over 15%. The highest percentage of the taxonomic workforce was in the 40–44 age group (18.1%) followed by the 45–49 age group (16.8%). Excluding the number of honorary (unpaid) members of the workforce significantly reduced the numbers in the 60+ age group, and including them resulted in the 60+ age group comprising the 2nd highest component of the taxonomic workforce. The lowest percentage was in the 20–24 age group which is to be expected as tertiary education is undertaken by the majority of the taxonomic workforce and many would still be undertaking studies in this age group.

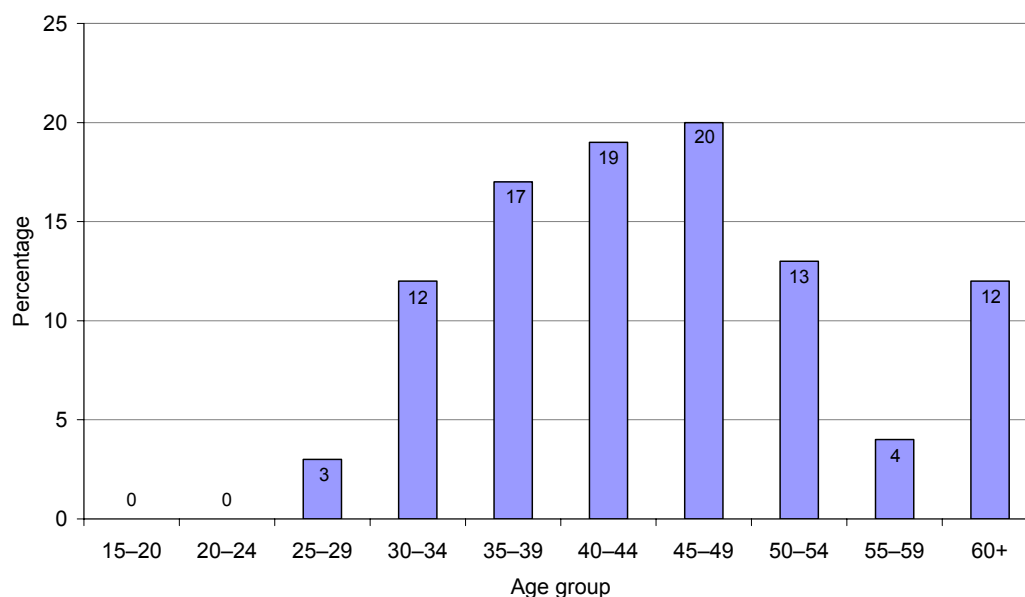


2003—Age of taxonomic workforce including honorary staff

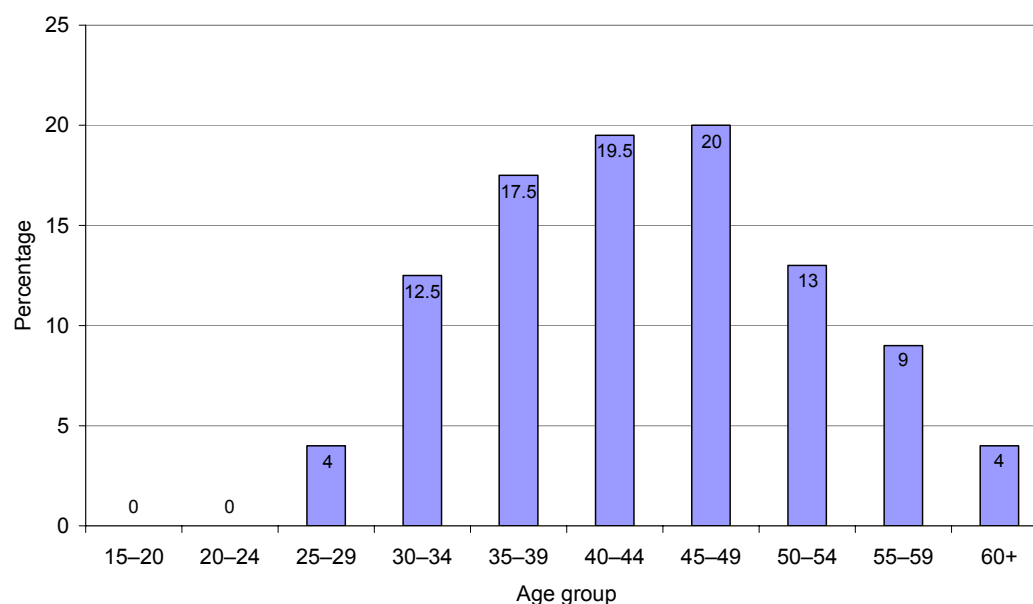


2003—Age of taxonomic workforce excluding honorary staff

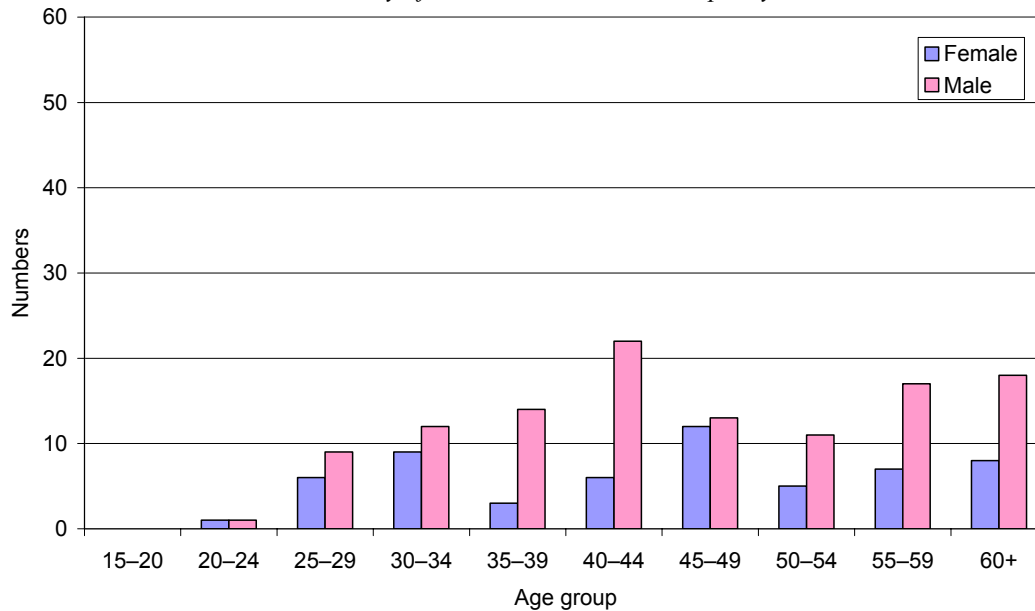
In 1991 there were three age categories that rated over 15%. Excluding the honorary staff the highest percentage of the taxonomic workforce was in the 45–49 age group (20.1%) followed by the 40–44 age group (19.5%), then the 35–39 age group (17.5%). When including honorary staff, the 60+ category became the 6th highest category (11.7%).



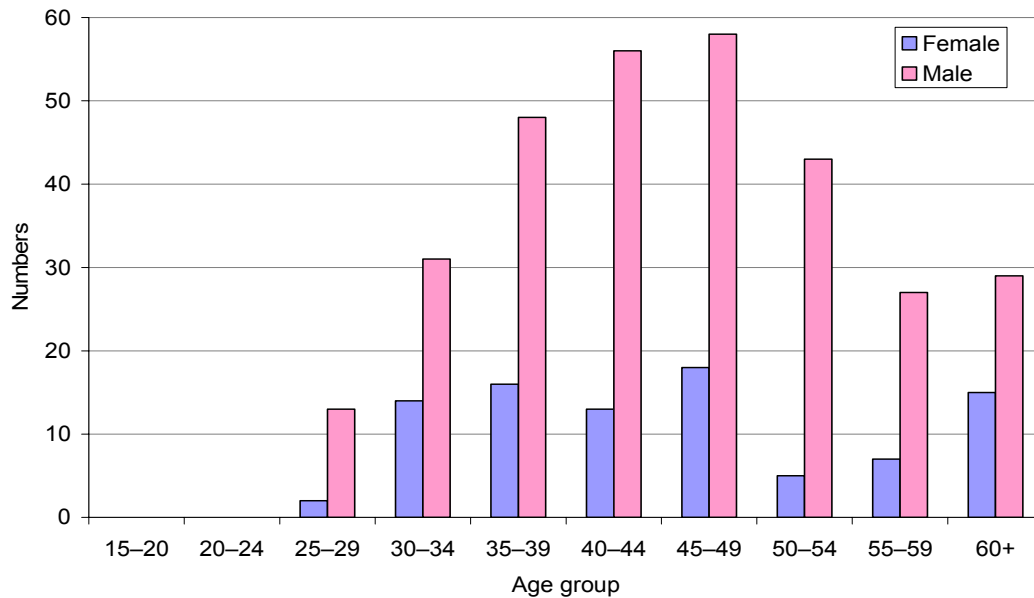
1991—Age of taxonomic workforce including honorary staff



1991—Age of taxonomic workforce excluding honorary staff

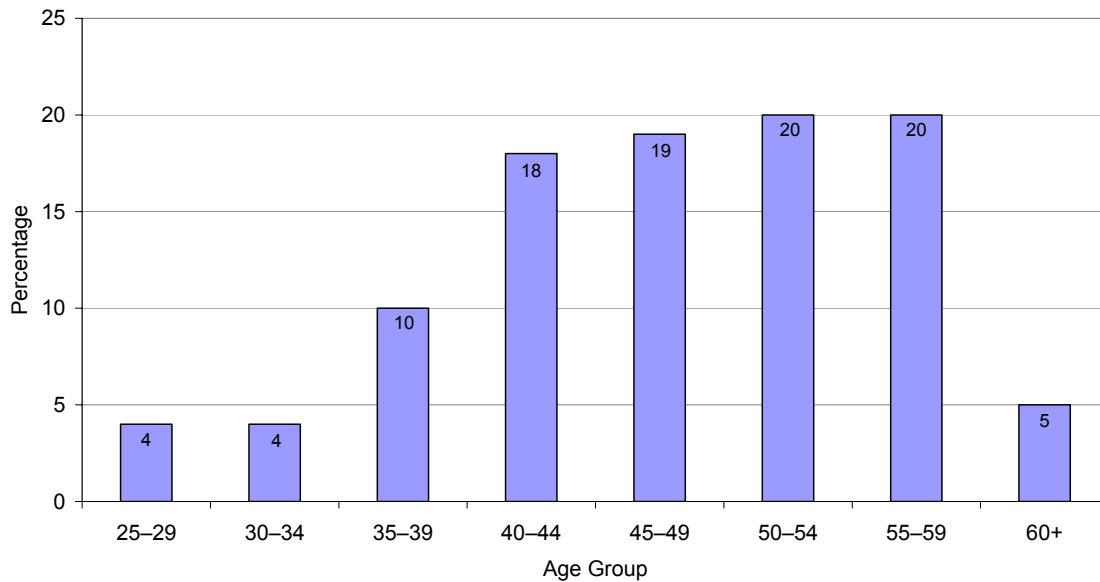


2003—Age groups of taxonomic workforce by gender

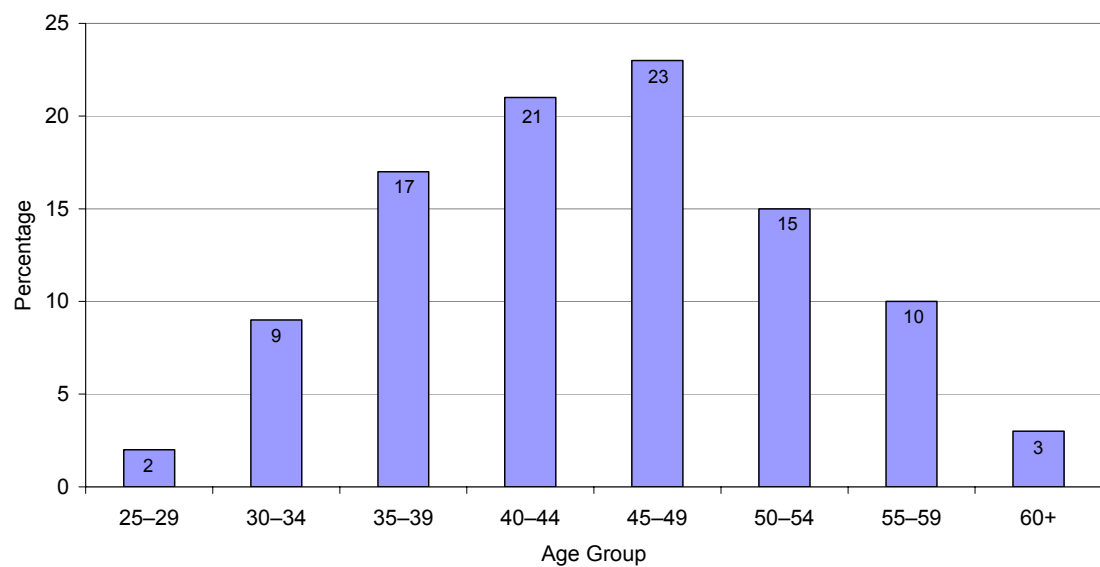


1991—Age groups of taxonomic workforce by gender

The number of men equalled or exceeded the number of women in all age groups in 2003. The greatest discrepancy between numbers of men and women occurred in the 35–44 age group and could be related to women having time away from the workforce to raise a family. In the 50+ age group the number of women in the taxonomic workforce was just under half that of men. In 1991 the number of men exceeded the number of women by a significantly larger margin than in 2003.



2003—Age range of just full-time permanent employees

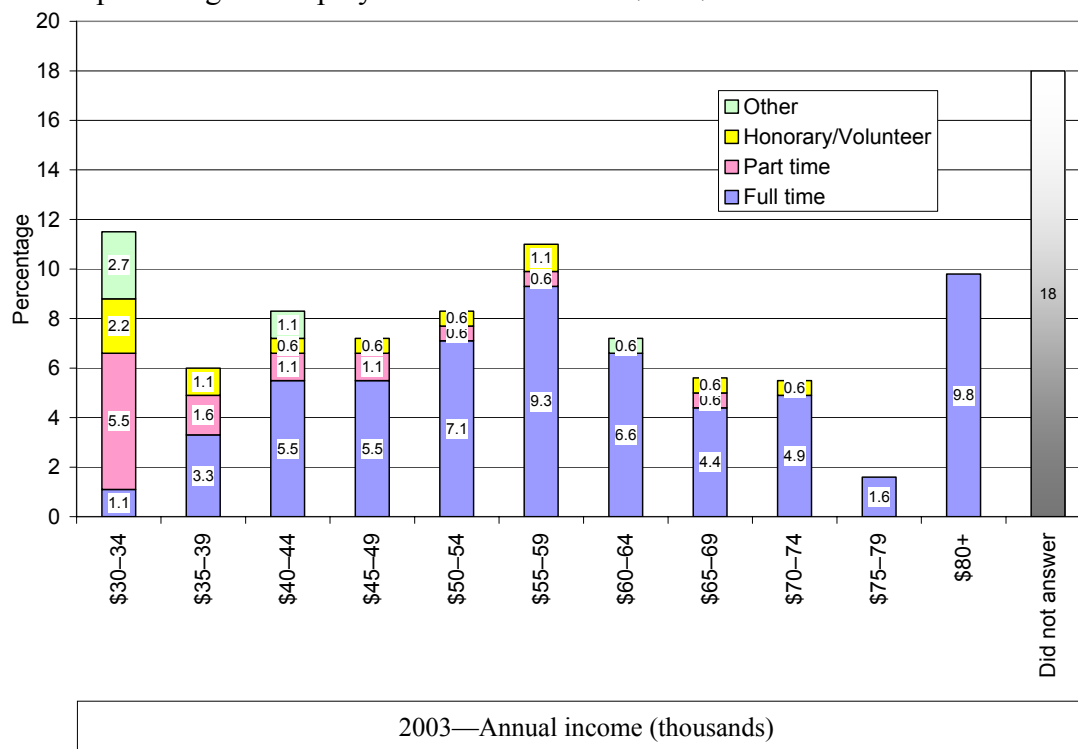


1991—Age range of just full-time permanent employees

In 2003 within just the full-time permanent category, the percentage of the workforce was highest in the 50–59 age group. In 1991 the highest percentage was in the (40–) 45–49 age group.

**Question 17****Which of the following best describes your approximate annual income before tax?**

The greatest percentage of the taxonomic workforce earned between \$30–\$34k/annum (11.5%) followed by those who earned \$55–\$59k (11%) and over \$80k (9.8%). The lowest percentage of employees earned between \$75–\$79k.



In the \$30–\$34k group 47.8% were part-time and 9.6% full-time. In all other categories the number of full-time staff exceeded the number of part-time staff. In the \$40k and above categories the number of full-time staff was by far the largest, with 100% in the \$75k+ income bracket and between 55% and 92% in the \$40–\$74k group. The percentage of part-time staff earning above \$40k/annum was low.

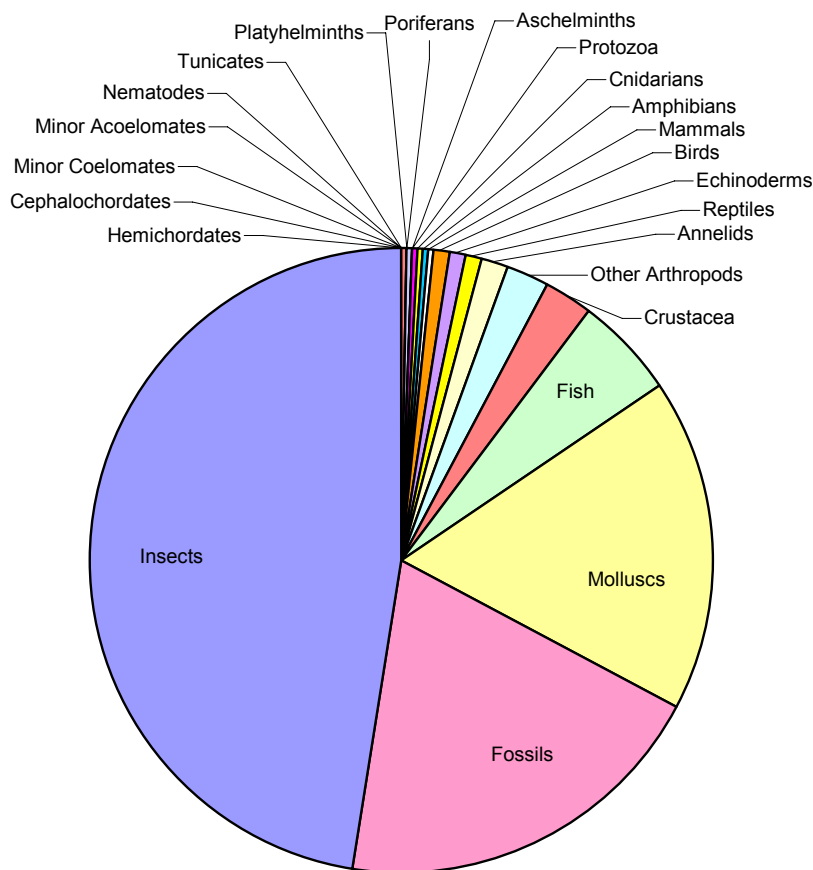




## Part B

### Resources of Australian Natural Science Collections

#### Collections: animal specimens

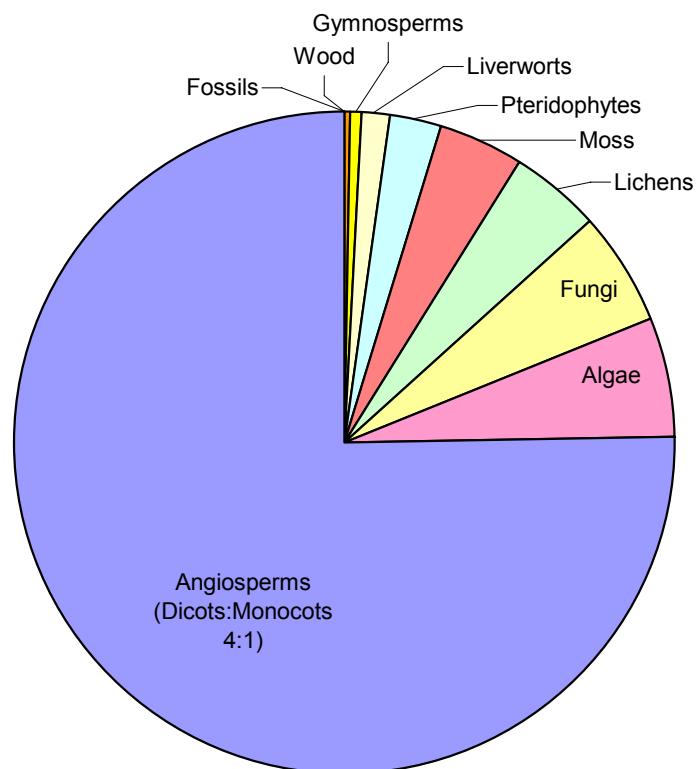


2003—Number of animal collections in natural science institutions

Insects	13,957,800
Fossils	5,767,860
Molluscs	5,099,080
Fish	1,539,438
Crustacea	746,200
Other Arthropods	614,090
Annelids	371,500
Reptiles	290,394
Echinoderms	274,343
Birds	174,478
Mammals	125,201
Amphibians	99,737
Cnidarians	67,494
Protozoa	65,989
Aschelminths	40,850
Poriferans	40,393
Platyhelminths	30,196
Tunicates	26,339
Nematodes	7,980
Minor Acoelomates	8,940
Minor Coelomates	8,240
Cephalochordates	761
Hemichordates	302
<b>TOTAL</b>	<b>29,357,605</b>

2003—Number of animal collections in natural science institutions

## Collections: traditionally grouped with plant specimens



2003—Number of plant and related collections in natural science institutions

Angiosperms (Dicots:Monocots 4:1)	5,294,849
Algae	409,135
Fungi	385,248
Lichens	318,831
Moss	292,145
Pteridophytes	179,966
Liverworts	92,717
Gymnosperms	44,219
Wood	16,155
Fossils	30
<b>TOTAL</b>	<b>7,033,295</b>

2003—Number of plant and related collections in natural science institutions

## Collections: other

Viruses	87,341
Bacteria	36,031
<b>TOTAL</b>	<b>123,372</b>

2003—Number of 'other' collections in natural science institutions

**Taxonomic Staffing Numbers from Institutional Surveys**

A number of previous surveys of taxonomic institutions and personnel have been undertaken by the Australian Biological Resources. The results of these are available in:

- W.D.L. Ride and Alison McCusker, *The extent and nature of programs in biological survey conducted primarily by State museums and herbaria*, Australian Biological Resources Study 1973–78, Australian Government Publishing Service 1978.
- B.J. Richardson and A.M. McKenzie, Australia's Biological Collections And Those Who Use Them, *Australian Biologist* 5(1): 19–30 (1992).
- L. Visher, *Professional Training and Recruitment in Systematics*, a report of the Australian Biological Resources Study, 1995.

The following data were used for comparing the 2006 taxonomic workforce with 1991 data<sup>1</sup> for the institutions shown below (this is a subset of the institutions surveyed).

**Data from the 2006 taxonomic capacity survey on numbers of taxonomic staff (institutions comparable to 1991 survey)**

Institution <sup>2</sup>	Scientist (perm.)	Scientist (temp.)	Technical (perm.)	Technical (temp.)	Administrator/ Manager	Honorary	Total
<b>Botany</b>							
BRIP	1.4	0.8	0.8	0.5	0	0.2	3.7
ACT (CANB+CBG)	6.2	4	15.8	6.5	3.2	9	44.7
DAR	0.5	0	1.2	0	0.5	1	3.2
KPBG	0	0	0.8	0	0.1	0.4	1.3
Mareeba	0	0	0.1	0	0	0	0.1
NSW*	9.1	2	7.4	1	1.2	4.2	24.9
NT (DNA)*	1.2	0	2.5	0	0.4	0	4.1
Qld (BRI)*	3.65	0.3	3.25	3.55	1.15	1.7	13.6
SA (AD)*	3.4	0.4	6.2	5.3	2.8	3.4	21.5
Tas (HO)*	2	1.2	1.1	2.2	0.5	1	8
Vic (MEL)*	6	3.3	6.2	0	2.1	2	19.6
WA (PERTH)*	3.7	4.1	11.4	7.1	2	2	30.3
<b>Total Botany</b>	<b>37.15</b>	<b>16.1</b>	<b>56.75</b>	<b>26.15</b>	<b>13.95</b>	<b>24.9</b>	<b>175</b>
<b>Zoology</b>							
ANIC	6	0	6.8	2.8	3.7	4.7	24
CSIRO Fish	1.5	0	2.4	0	0.3	0	4.2
NSW*	12	1	31	15	4	9	72
NT*	7	1	4	0	1	1	14
Qld* <sup>3</sup>	17.8	10.3	10.6	1.1	1.5	41.3	82.6
SA*	7	3	12	2	2	16	42
Tas*	0	0.5	0	0.5	0.5	0	1.5
Vic*	10	0	10	3	0	2	25
WA*	10	5	8	5.2	0.25	1.6	30.05
<b>Total Zoology</b>	<b>71.3</b>	<b>20.8</b>	<b>84.8</b>	<b>29.6</b>	<b>13.25</b>	<b>75.6</b>	<b>295.35</b>
<b>Institution</b>	<b>Scientists (perm.)</b>	<b>Scientists (temp.)</b>	<b>Technical (perm.)</b>	<b>Technical (temp.)</b>	<b>Administrator/ Manager</b>	<b>Honorary</b>	<b>Total</b>
<b>Total Botany and Zoology</b>	<b>108.45</b>	<b>36.9</b>	<b>141.55</b>	<b>55.75</b>	<b>27.2</b>	<b>100.5</b>	<b>470.35</b>

<sup>1</sup> The 1991 data were published in Richardson and McKenzie (1992) however in that publication Collection Managers were included with Technical staff and here they are separated. Also the 1991 questionnaire requested numbers of Administrative staff, but in the publication these were labelled Administrators—Administrative is used here.

<sup>2</sup> The acronym for a State/Territory institution may be given in parentheses following the State/Territory abbreviation.

\* Data from the institutions that are asterisked were compared with 1975 and 1991 data from the same institutions later in this report.

<sup>3</sup> Data includes Qld Zoology and Palaeontology.

**Data from the 1991 taxonomic capacity survey on numbers of taxonomic staff (institutions comparable to 2006 survey)**

Institution <sup>4</sup>	Scientist	Collection Manager	Technical	Administrative	Library/ Editorial	ADP <sup>5</sup>	Total
<b>Botany</b>							
BRIP	1	1	0	0	0	0	2
ACT (CANB+CBG)	13.2	2.2	15.5	1.5	1.3	1.5	35.2
DAR	1.7	0.5	1.3	0	0	0.5	4
KPBG	1	1	0	0.1	0.1	0	2.2
Mareeba	1.5	0	0	0	0	0	1.5
NSW*	14	0	14	2	4	1.5	35.5
NT (DNA)*	2	0.5	3	0.5	0	0	6
Qld (BRI)*	6.4	0.8	8.35	0.75	0.6	0	16.9
SA (AD)*	7	0	4	0	0	1	12
Tas (HO)*	3	0	1	1	0	0	5
Vic (MEL)*	8	0	7	0.8	0.5	0.5	16.8
WA (PERTH)*	8.8	0	3	4	2.2	1	19
<b>Total Botany</b>	<b>67.6</b>	<b>6</b>	<b>57.15</b>	<b>10.65</b>	<b>8.7</b>	<b>6</b>	<b>156.1</b>
<b>Zoology</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
ANIC	10.5	1	11.5	2	0.5	0	25.5
CSIRO Fish	2	1	1.4	0	0	0	4.4
NSW*	17.5	6.5	14.5	2	0	0	40.5
NT*	9	0	3	0	0	0	12
Qld* <sup>6</sup>	20	0	14	7.2	3.2	1	45.4
SA*	11.5	0	15	3	2	0	31.5
Tas*	3	0	3	1	0.5	0	7.5
Vic*	14	3.5	6	0	0.2	0	23.7
WA*	15	0	9.5	5.25	0.4	0.25	30.4
<b>Total Zoology</b>	<b>102.5</b>	<b>12</b>	<b>77.9</b>	<b>20.45</b>	<b>6.8</b>	<b>1.25</b>	<b>220.9</b>
<b>Institution*</b>	<b>Scientist</b>	<b>Collection Manager</b>	<b>Technical</b>	<b>Administrative</b>	<b>Library/ Editorial</b>	<b>ADP</b>	<b>Total</b>
<b>Total Botany and Zoology</b>	<b>170.1</b>	<b>18</b>	<b>135.05</b>	<b>31.1</b>	<b>15.5</b>	<b>7.25</b>	<b>377</b>

There was some difference in the employment categories used between 1991 and 2006. The scientist category is considered to be comparable between the two years. Librarian/editor, administrative and ADP were not specifically requested in 2006, however, it is considered that such staff where involved with taxonomic work would have been included in the technical group in 2006 and this is reflected in the increase in the size of the technical category.

In the subset of institutions used for comparison of 1991 and 2006 data the numbers of scientists involved in taxonomic work dropped from 170.1 to 145.35.

The number of technical staff increased from 106.4 (including librarian/editor/ADP but excluding collection managers) to 197.3 (excluding administrator/managers) in 2006. In 2006 temporary staff in herbaria accounted for 46% of all technical staff, whereas in Museums the number was 35%.

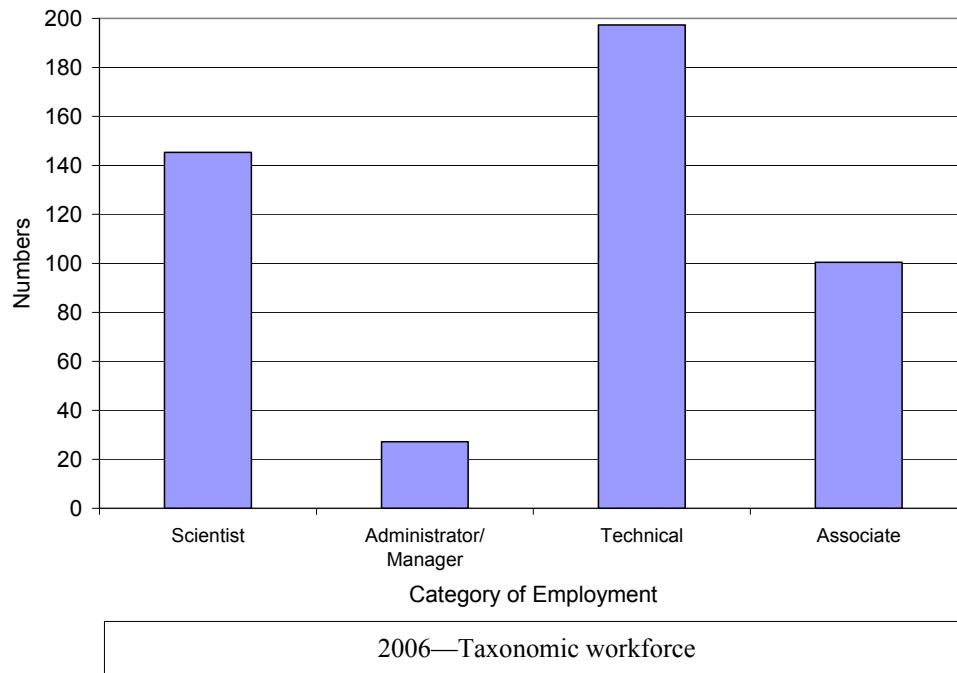
<sup>4</sup> The acronym for a State/Territory institution may be given in parentheses following the State/Territory abbreviation.

<sup>5</sup> Automatic Data Processing.

\* Data from the institutions that are asterisked were compared with 1975 and 2006 data from the same institutions later in this report.

<sup>6</sup> At this time Qld Zoology and Palaeontology were combined.

*ABRS—Survey of Australian Taxonomic Capacity 2003/2006*



The data in the following table and charts were used for comparing the 2006 taxonomic workforce with 1975 and 1991 data<sup>7</sup> for the institutions shown below.

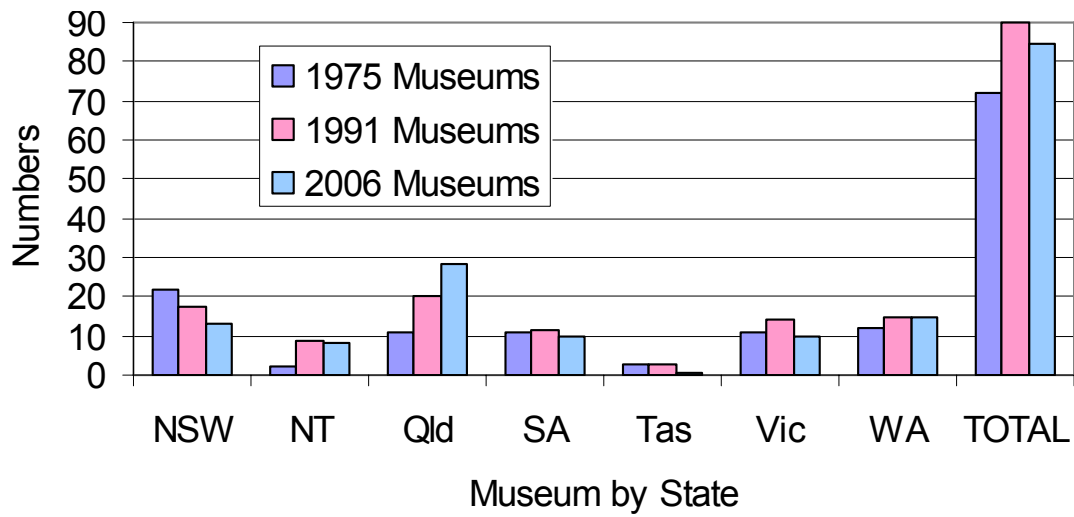
**Data from the 1975, 1991 and 2006 taxonomic capacity survey on numbers of taxonomic staff at institutions**

<b>Institution<sup>8</sup></b>	<b>1975</b>	<b>Scientist</b>	<b>Honorary</b>	<b>1991</b>	<b>Scientist</b>	<b>2006</b>	<b>Scientist</b>	<b>Honorary</b>
<b>Botany</b>								
NSW		14	1		14		11.1	4.2
NT (DNA)		0	0		2		1.2	0
Qld (BRI)		16	0		6.4		3.95	1.7
SA (AD)		5	0		7		3.8	3.4
Tas (HO)		0	2		3		3.2	1
Vic (MEL)		6	3		8		9.3	2
WA (PERTH)		9	0		8.8		7.8	2
<b>Total Botany</b>		<b>50</b>	<b>6</b>		<b>49.2</b>		<b>40.35</b>	<b>14.3</b>
<b>Zoology</b>					<b>0</b>			
NSW		22	9		17.5		13	9
NT		2	0		9		8	1
Qld <sup>9</sup>		11	2		20		28.1	41.3
SA		11	12		11.5		10	16
Tas		3	2		3		0.5	0
Vic		11	2		14		10	2
WA		12	4		15		15	1.6
<b>Total Zoology</b>		<b>72</b>	<b>31</b>		<b>90</b>		<b>84.6</b>	<b>70.9</b>
<b>Institution</b>	<b>1975</b>	<b>Scientist</b>	<b>Honorary</b>	<b>1991</b>	<b>Scientist</b>	<b>2006</b>	<b>Scientist</b>	<b>Honorary</b>
<b>Total Botany and Zoology</b>		<b>122</b>	<b>37</b>		<b>139.2</b>		<b>124.95</b>	<b>85.2</b>

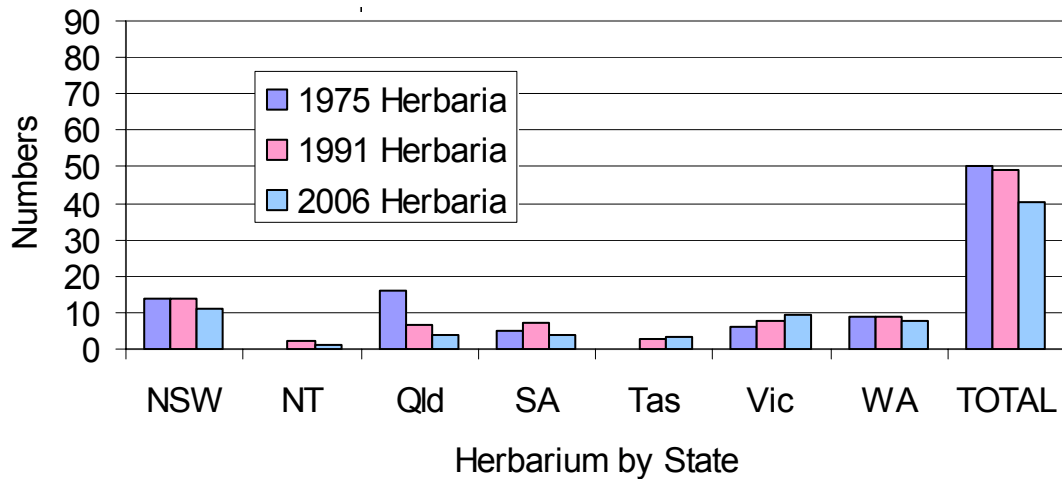
<sup>7</sup> The 1991 data were published in Richardson and McKenzie (1992) however in that publication Collection Managers were included with Technical staff and here they are separated. Also the 1991 questionnaire requested numbers of Administrative staff, but in the publication these were labelled Administrators. In line with the original questionnaire Administrative is used here.

<sup>8</sup> The acronym for a State/Territory institution may be given in parentheses following the State/Territory abbreviation.

<sup>9</sup> At this time Qld Zoology and Palaeontology were combined.

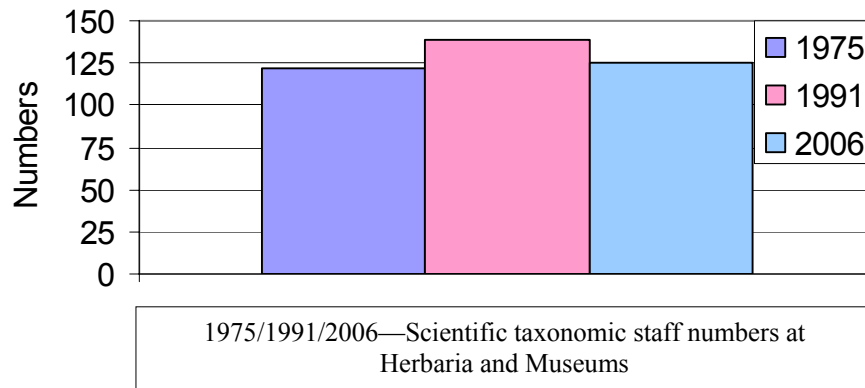


1975/1991/2006—Taxonomic workforce comparisons for Museums



1975/1991/2006—Taxonomic workforce comparisons for Herbaria





In the subset of institutions there were 122 scientists involved in taxonomy in 1975, 139.2 in 1991 and 124.95 in 2006.



In the selected institutions in 1975 there were 37 honorary staff. No data was collected in 1991, and in the 2006 survey the figure had grown to 85.2.

The following charts and tables reflect the entire data set from the 2006 survey of taxonomic capacity regarding staffing levels at institutions.

Institution	Scientist (taxonomy, permanent)	Scientist (taxonomy, not permanent)	Technical (taxonomy, permanent)	Technical (taxonomy, not permanent)	Administrator/ Manager	Associate	Total
<b>Botany</b>							
AD	3.4	0.4	6.2	5.3	2.8	3.4	21.5
BRI	3.65	0.3	3.25	3.55	1.15	1.7	13.6
BRIP	1.4	0.8	0.8	0.5	0	0.2	3.7
CANB+ CBG	6.2	4	15.8	6.5	3.2	9	44.7
DAR	0.5	0	1.2	0	0.5	1	3.2
DNA	1.2	0	2.5	0	0.4	0	4.1
HO	2	1.2	1.1	2.2	0.5	1	8
KPBG	0	0	0.8	0	0.1	0.4	1.3
Mareeba	0	0	0.1	0	0	0	0.1
MEL	6	3.3	6.2	0	2.1	2	19.6
NSW	9.1	2	7.4	1	1.2	4.2	24.9
PERTH	3.7	4.1	11.4	7.1	2	2	30.3
<b>TOTAL Botany</b>	<b>37.15</b>	<b>16.1</b>	<b>56.75</b>	<b>26.15</b>	<b>13.95</b>	<b>24.9</b>	<b>175</b>
<b>Zoology†</b>							
ANIC	6	0	6.8	2.8	3.7	4.7	24
CSIRO Fish	1.5	0	2.4	0	0.3	0	4.2
CSIRO Soils	0	0.4	0	0	0.1	0.05	0.55
CSIRO Wildlife	1.5	0	1	1.4	2.1	0.1	6.1
NSW	12	1	31	15	4	9	72
NT	7	1	4	0	1	1	14
Qld Zoology	14.8	10.3	8	0.9	1.5	20	55.5
Qld: Palaeo.	3	0	2.6	0.2	0	20	25.8
SA	7	3	12	2	2	16	42
Tas	0	0.5	0	0.5	0.5	0	1.5
Vic	10	0	10	3	0	2	25
WA	10	5	8	5.2	0.25	1.6	30.05
<b>TOTAL Zoology</b>	<b>72.8</b>	<b>21.2</b>	<b>85.8</b>	<b>31</b>	<b>15.45</b>	<b>74.45</b>	<b>300.7</b>
<b>Institution</b>	<b>Scientist (taxonomy, permanent)</b>	<b>Scientist (taxonomy, not permanent)</b>	<b>Technical (taxonomy, permanent)</b>	<b>Technical (taxonomy, not permanent)</b>	<b>Administrator/ Manager</b>	<b>Associate</b>	<b>Total</b>
<b>Total Botany and Zoology</b>	<b>109.95</b>	<b>37.3</b>	<b>142.55</b>	<b>57.15</b>	<b>29.4</b>	<b>99.35</b>	<b>475.7</b>

The following chart displays the information from the preceding table. It shows that in 2006 the largest component of the taxonomic workforce was permanent technical staff, followed by permanent scientists, honorary/associate staff, temporary technical staff, temporary scientists and finally administrator/managers.

