When re-assessed a year later, it was reported that it was "a pleasure to see and test this man again because he had made so much progress. He had improved on almost all measures and although he said that he still gets tired and has lots of headaches, he seemed to be managing his taxi run well."

Three tests had improved. The digit span reaction time and word fluency to within the normal range. Tests which had improved, but still demonstrated an impaired score, were visual memory and verbal memory. It is unlikely that this man would make as much progress in the next 2 years as he has in the last, but even if he makes no progress at all, his cognitive function is now at a level where he should be able to cope reasonably well."

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THE WORLD AS IT IS

CALCULATING DIVER NUMBERS: CRITICAL INFORMATION FOR SCUBA SAFETY AND MARKETING PROGRAMS

Jeffrey Wilks

Introduction

A question frequently asked of the recreational scuba diving industry is "How many active divers are there?" The answer to that question is, of course, that "there are no reliable estimates of active divers within Australia".[1] While the question is asked by different people, for different reasons, two broad interest groups can be identified.

The first group is interested in establishing the size of a potential customer market. This group may include tourism authorities, insurance agents, equipment wholesalers and retailers, training agencies, the media and various government departments. In fact, marketing enquiries form the majority of requests for diving statistics.

The second group seeks information on the number of active scuba divers to provide a background or perspective on safety. This group may include medical practitioners, health and safety authorities, dive industry associations, lawyers and the scuba training agencies. To some extent there is an overlap between the groups as those concerned with marketing will also be interested in safety, since it is an important component of the diving product.

Obtaining accurate estimates for the number of certified divers is a difficult process, as evidenced by the continuing debate in the United States.[2,3] One of the main barriers to calculating accurate figures is the fact that scuba certification cards do not expire. Once a diver has completed his or her entry level qualification there is no easy way to determine whether they continue on as an active diver or drop out from the sport. Even the definition of an "active diver" varies, though the accepted consensus, used in this paper, seems to be "at least one dive in the previous 12 months".[4,5] There are some who consider that the figure should be 5 to 10 dives a year as fewer dives would fail to maintain the diver's skills.

Identifying groups of divers

One approach to the question of diver numbers is first to identify unique groups, then attempt to count participants. Ten separate groups have been identified in Queensland. A brief description of each group follows, along with initial attempts to determine the number of dives made by the groups during 1991.

The intention of this project was to estimate the number of dives made in Queensland over a one year period, rather than the number of divers. Pilot studies had clearly shown that it would be impossible to track individual divers, especially if they were members of groups which had no contact with training agencies or commercial dive facilities. In addition, the total number of "safe" dives completed was considered a more appropriate figure for the purpose of placing accident statistics in their proper perspective.

1 NEW DIVERS TRAINING FOR ENTRY LEVEL CERTIFICATION

The first group consists of new divers who have recently completed an open water course. Confidential figures were obtained from all four Australian training agencies on the number of open water courses conducted in

TABLE 1

FORMAL TRAINING DIVES CONDUCTED IN QUEENSLAND DURING 1991

Training level	No. of courses	Average No of dives	Total
Open water	26,883	4	107,532
Advanced	5,169	5	25,845
Specialties	1,109	3	3,327
Rescue	839	5	4,195
Divemaster	469	20	9,380
Assistant Instructor	48	14	672
Instructor	174	20	3,480

Queensland during 1991. The combined figure for new certifications issued was 26,883. This figure can be multiplied by a minimum of four open water training dives to give the total number of dives made by the group.

2 DIVERS IN CONTINUING EDUCATION COURSES

Continuing education programs are offered by all four training agencies. Following entry level certification divers can take specialty courses such as photography, deep diving, night diving and equipment maintenance. Leadership programs (divemaster and instructor) are also available for those wishing to work in the recreational diving industry.

Table 1 is based on confidential figures supplied by the training agencies and shows the number of different certifications issued in Queensland during 1991. An average number of dives associated with each type of course has also been included to allow for a calculation of the total number of dives made by the group. The average number of dives assigned to divemaster and instructor training programs is intentionally very conservative.

3 RESORT OR INTRODUCTORY COURSES

Resort scuba programs are an important part of the Queensland recreational diving industry.[6,7] The objective of these non-certification courses is to provide the student with a safe, enjoyable introduction to diving under the direct supervision of an instructor.

Because these courses do not result in a certification being issued, the training agencies do not routinely register participants or keep records of the number of courses conducted. To gain this information an independent study was undertaken. All dive operators in Queensland (retail shops, resorts and charter operators) were contacted and asked to provide information on the number of resort course dives they conducted during 1991. A total of 111 companies participated, with a reported 85,000 dives. Given that several companies specialising in this area refused to participate, the figure obtained is considered very conservative.

4 CERTIFIED SOCIAL DIVERS USING COMMERCIAL SERVICES

Based on the replies of the 111 Queensland companies there were 383,742 non-training recreational (social) dives conducted during 1991. This figure is considered very conservative since there are many small charter vessels operating along the Queensland coast that were not included in the study. Also, many dive clubs and independent instructors conduct social dives, but do not necessarily have contact with the main commercial diving services. The figure does, however, give some indication of the size of the main tourist diving market being serviced along the Great Barrier Reef.

5 INSTRUCTORS

As at 30th June, 1991 there were 636 registered instructors in Queensland. Instructors dive in a number of categories: as teachers of open water and continuing education courses; as supervisors of resort courses; as guides for certified divers; and as social divers in their own right. Table 2 presents calculations of the approximate number of dives that may be attributed to this group, based on instructor-student training ratios. Additional figures for private or social diving, and for the number of dives made as a guide for certified customers, cannot even be guessed at. The figures for the instructor group are therefore very conservative underestimates.

TABLE 2

ESTIMATES OF INSTRUCTOR DIVES IN QUEENSLAND DURING 1991

Open water training dives *	26,883
Continuing education dives **	6,461
Resort course dives ***	21,250
Guide for certified divers	Unknown
Private or social dives	Unknown

* Based on an average class group of 4 students with 4 training dives.

** Based on an average class group of 4 students with 5 training dives.

*** Based on an average class group of 4 students each dive.

6 DIVEMASTERS

The number of dives made by divemasters is even harder to calculate because, as a group, they do not issue training certifications. They are, however, involved in training programs by acting as certified assistants to an instructor. Divemasters also lead orientation dives, and can take resort course students on their second dive of the day. Finally, they dive socially themselves. Unfortunately, without a comprehensive study of all divemasters in Queensland the potentially large number of dives made by this industry group remains unknown.

7 CERTIFIED DIVERS OBTAINING COMMERCIAL AIR FILLS, BUT NO OTHER SERVICES

Currently there is no requirement for retails shops or other commercial suppliers to record their number of air fills. Since many certified divers have their own equipment, including tanks, the only contact they may have with commercial facilities is for an air fill. Given this situation, there is no way to calculate the size of this independent group, nor their number of dives.

8 CERTIFIED DIVERS WITH THEIR OWN AIR, REQUIRING NO COMMERCIAL SERVICES

As with the previous group, the number of independent divers with access to private compressors for air fills is not known.

9 UNCERTIFIED RECREATIONAL DIVERS

There are probably still substantial numbers of uncertified recreational divers in the community. This group includes people who are self-taught and have never taken a formal course, through to new divers trying scuba with a certified friend without an instructor rating. When a certified diver has more than one tank filled at a commercial outlet there is no reason or requirement for staff to question whether the extra tanks are to be used by certified buddies.

10 POOL EXPERIENCES ONLY

In contrast to the commercial resort course programs run along the Queensland coast, there are also many one-off pool scuba experiences conducted each year. "Splash parties" are popular in the United States as a way of creating interest in diving, and are often used by instructors as part of general advertising and public relations. Similarly, it is common for large groups of school students to be offered an introductory pool experience as part of an educational program. Since these courses are not registered with the training agencies it is virtually impossible to estimate the number of dives conducted each year.

TABLE 3

SUMMARY OF CURRENT KNOWLEDGE FOR THE NUMBER OF SCUBA DIVES IN QUEENSLAND DURING 1991

Open water training dives	107,532
Continuing education dives	46,899
Resort course dives	85,000
Certified social dives (through commercial services)	383,742
Instructors	54,594
Divemasters	Unknown
Certified dives (air fills only)	Unknown
Certified dives (own air)	Unknown
Non-certified dives	Unknown
Introductory pool experiences	Unknown

Summarising Queensland diver numbers

Table 3 presents a summary of current knowledge for the number of scuba dives made in Queensland during 1991. A very conservative total of 677,767 dives was recorded from the five categories where data was available.

Several large companies specialising in resort diving declined to participate in the company study. Based on industry information, the figure for resort dives per year is probably in excess of 100,000. Similarly, the figure for certified social divers using commercial services is a very low estimate, given that there are many charter vessels and independent instructors operating along the Queensland coast who did not participate in the company study. As Telford notes, some industry sources suggest that there are conservatively 500,000 dives made in the Cairns area alone each year.[8] In addition, the Queensland Dive Tourism Association reports that there were 884,000 recreational dives made in the state from July 1989 to June 1990.[9] Unfortunately, the report does not provide details about the sampling and methodology used to determine this number of dives.

Assuming that most working instructors in Queensland would make at least five dives per week during a 40 week year, a more realistic approximation of instructor dives (based on 636 instructors) is 127,200. Assuming further that divemasters make at least half the number of instructor dives (Table 1 shows there were almost three times the number of dive masters certified in 1991 compared to instructors) then the "known" figures for Queensland exceed 800,000. By adding in the certified divers across the state who have little or no contact with commercial facilities, as well as the many introductory pool experi-

ences offered each year, the final figure is probably closer to one million recreational dives made in Queensland each year.

While recognising that the figures in Table 3 are very conservative, a particular concern for the Australian recreational dive industry should be the fact that no information at all is available for five of the ten identified diver categories. Without this information any diving accidents that do occur cannot be placed in their proper perspective. This makes policy negotiations with insurance companies more difficult for divers, and for the industry in general. It also makes marketing of the sport less effective if the total number of safe dives conducted each year is not known.

At the present time, training agencies and government departments are understandably reluctant to breach client confidentiality and risk legal action by releasing details (or numbers) of accidents that have been recorded. However, in the absence of reliable figures the media will continue to perpetuate myths that diving is a dangerous activity. By gathering complete data on the number of recreational dives made each year, and comparing these figures with the relatively small proportion of accidents occurring, some definitive statement could be made about safety.

This initial report suggest that there are 10 diving categories where data should be collected. There are minimal statistics available for five categories and no information about the other five. Cost-effective strategies that guarantee commercial confidentiality, while gaining much needed information about the five unknown categories, are currently being investigated.

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WORKSAFE AUSTRALIA CODE OF PRACTICE FOR OCCUPATIONAL DIVING.

Ian Millar

A draft Code Of Practice for Occupational Diving is under development. The working group meetings have been completed and a document is to be circulated to the reference bodies, including SPUMS, before release for public comment. The following briefly describes the context and progress of this development which is to provide a replacement for Australian Standard AS2299 - 1992

"Worksafe" is a shorthand name for the National Occupational Health and Safety Commission, a tripartite body (employers, governments and unions) established by the Federal Government to develop, facilitate and implement a national approach to occupational health and safety.

Among other roles, it develops "Codes of Practice" for the control of risk associated with specific workplaces and activities. These must then be applied by the States. However, with general agreement upon the principle of national uniformity of Occupational Health and Safety (OH&S) legislation, it is expected that any national codes of practice should be applied in a uniform manner from 1994 onwards.

Modern OH&S legislation now applies in all states, and differs significantly from the prescriptive approach taken previously. In the past, specific laws allowed government bodies to set regulations that were legally binding upon employers. These regulations often set very specific requirements, in some cases by calling up existing standards such as Australian Standards. Breach of any requirement