

Roundup of Marine Education around Australia

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Jobs in the marine industry are found on boats at sea and in shore-based operations. There are a lot more jobs on shore than at sea but you still need an understanding of life at sea and the nature of the marine environment wherever you work.

The best way to learn about marine employment is to gain experience in the marine industry and then, if you like the field of work, organise through your school to learn about traineeships while you are still in full-time education. This gives you the flexibility to either take up a career after studying at a tertiary institute or a career in a full-time job where you gain your qualifications while working.

The world of work

Most schools offer **work experience** programs in which you spend a week at work. During this time you will experience the joys of waking up a bit earlier, getting yourself off to work by yourself and carrying out the routine tasks associated with most jobs. The world of work is fun because you get to work in a team, earn your own money and stand on your own two feet.

What work experience is like

What's it like on work experience? Take the example of getting some work experience on a cruise boat like the one shown in Figure 1.2. The first day you will probably just go out on the cruise, roll some napkins, help wash the boat and help the crew load and unload stores. In fact you may roll napkins, wash the boat and load the stores each day of your placement because this is what has to be done each day in order for the ship to operate. On board the ship you may also find a marine biologist with a university degree who also rolls napkins, washes the boat and loads the stores.

These days, in a small business or in the close working conditions of a ship, everyone has to be **multiskilled**. This means that you are trained to do many tasks in the one job. Marine biologists who work on cruise boats are multiskilled because they not only have to have a science degree, but also need to know how to tie

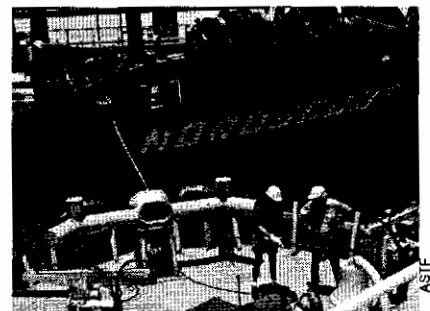


Figure 1.1 There are many careers available in the marine industry.

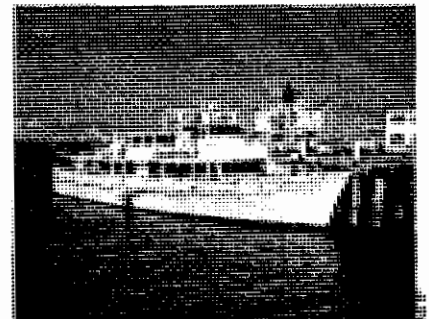


Figure 1.2 Cruise boat

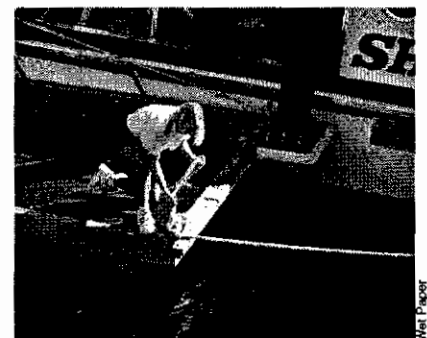


Figure 1.3 Working as a team to help moor the boat



Figure 2.1 Cleaning the head

a bowline, pour a standard drink, use a fire extinguisher and give first aid and resuscitation where necessary.

The **shipmaster** or **skipper** is in charge of the ship and may allow you to help with some navigation and explain to you what happens on board. You will learn to do team tasks like helping tie up the vessel (Figure 1.3) or individual tasks like cleaning the ship's head (lavatory) as shown in Figure 2.1. Other days of your work experience may be spent on shore learning how bookings are made and how to take telephone messages, answer the phone and do the banking.

Work experience is a combination of fun and fear. You will find you are treated very differently from how you are treated in school because you are helping to earn your boss a profit and working in a team for a common purpose.

In the workplace

Most research into what employers want from new employees reveals two essential elements — communication and good attitude. These are the building blocks of employment. So never be late, always try your hardest, communicate well and have a bright, happy, pleasant attitude.

Structured work placements

Industry partnerships

In the 1990s, many of our schools took on a new and exciting role in **vocational education** in which students at school learn about the skills they need at work in specific areas. Because teachers are not expected to know about every job out there in the workplace, the scheme includes **industry partners**. Many schools that teach Marine Studies are now involved with these industry partners — a scheme that was supported by the Australian Student Traineeship Foundation or ASTF.

Figure 2.2 shows an industry partner with a Marine Studies teacher. The industry partner has a small fishing charter business and the teacher ran a Marine Studies course at school. The industry partner wanted the students to have some basic marine skills before coming to work, for example, know how to tie knots, navigate, drive a boat, start and maintain the outboard motor, bait a line, gaff a fish and use a marine radio. These were skills that could not be taught in the classroom and so learning occurred on and off the job.

In **structured work placements**, the marine teacher runs classes in some of the basic marine skills at school and then the students spend time with the employer to learn



Figure 2.2 Industry partner and school vocational education coordinator



Figure 2.3 Students learn how to use a marine radio at sea.

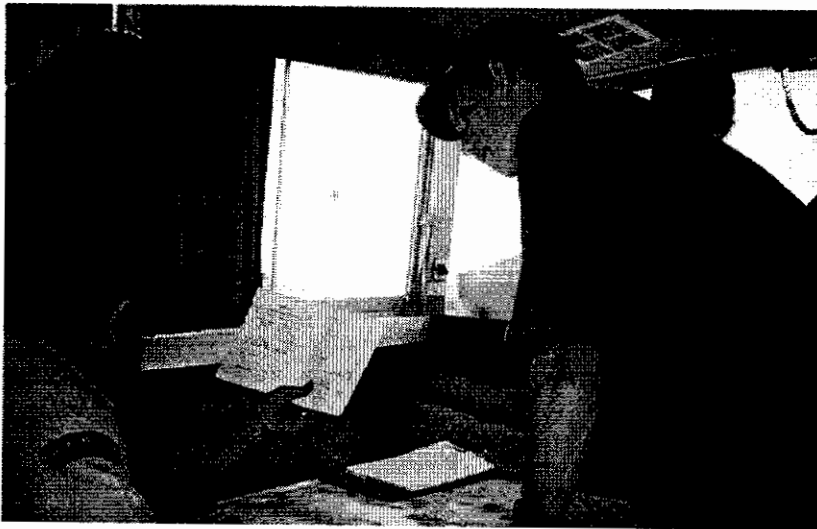


Figure 3.1 Workplace assessor and trainee discuss radio logbook.

skills that are more appropriately taught in the workplace and practice and improve skills taught in the classroom. For example, students learned the basics of how to use a marine radio at school and then had the opportunity to get lots of practice at work (Figure 2.3).

Getting a job

The value of the attainment of marine skills in a school–industry learning relationship is that students can gain qualifications that are **nationally recognised**. The types of skills that are to be learned are grouped into **competencies** which are recognised in all states by the marine industry. For example one of the competencies required to operate a marine radio is to be able to switch on, tune and operate VHF, HF and 27MHz marine radio transceivers.

Once you achieve all other competencies needed in operating a marine radio (and there are over 20), you can take them to any employer anywhere in the country and he or she will know that you have been trained to use a marine radio to the industry standard.

Becoming competent

In the world of work, you are rarely assessed on marks and percentages but on your competencies or on how you do the job. In the workplace, for example, you are not likely to be given a written exam on how to use a radio at the end of your day's training. Rather you will be expected to demonstrate that you are competent in what you have learned. Training competencies are then recorded in your training **logbook** by a **workplace assessor** (Figure 3.1). This is a person in the workplace who has been trained to test your skills and has substantial experience in the particular industry in which they are assessing.

This often means that your logbook will show if you can perform a skill or you can't. In our radio example, you can show your

“The types of skills that are to be learned are grouped into competencies which are recognised in all states by the marine industry”



Figure 3.2 School marine vocational education coordinator



Figure 4.1 The engine room



Figure 4.2 Tour host

competencies by being able to switch on, tune and operate VHF, HF and 27MHz marine radio transceivers as outlined above.

In the world of work everyone starts the same way at the bottom of the learning curve and knowing nothing. However, as your team work mates explain your new tasks you are expected to become competent in them. This is why your **attitude** to learning has to be positive and your communication skills have to be sound so that you can feel confident in asking for help. At first you will be not be competent because you will only be able to do tasks under supervision.

You will become competent when you can actually perform the task. For example, your skipper may ask you to get a weather report using the radio. If you are competent you will know when you can call, what radio and channel to select and how to make the call, write down the information and deliver it to the skipper in neat handwriting.

Getting more pay at work

If you work in a multiskilled work place, you could undergo training and you could find that you are paid according to your level of competence. Under modern workplace agreements, you can gain pay rises in a number of ways. A group of workers can collectively bargain with their union for a better pay deal, or you as an individual can undertake training and negotiate a voluntary employer agreement that is related to your competencies. To prove these competencies you can study to become a coxswain and then a shipmaster. Some modern workplaces allow you to do training on the job where you learn and be assessed by your workmates who train you in new competencies.

Many high schools now teach competencies. Technical colleges, private providers (people running private training businesses), colleges and universities offer a range of courses including,

“You will become competent when you can actually perform the task.”



Figure 4.3 Cruise attendant

training in competencies which lead to higher level certificate courses.

Marine traineeships

The best way to start your marine training is with introductory certificates in Maritime Services. This may take 1–2 years depending on whether you study part-time or full-time. Then you can decide which job you want. If you are really interested, your school vocational officer will help (Figure 3.2).

Certificates

A certificate is made up of many course elements. Industry entry certificates are usually at Levels 1 and 2. A deckhand must complete many hours of work to get an introductory certificate in order to progress to the next level of coxswain.

A **coxswain** is a person who has achieved a higher qualification and who has many days experience at sea. They can be in charge of a vessel that takes paying passengers.

A deckhand can also progress to becoming a **marine engineer** who is responsible for the operation and maintenance of power-driven sea vessels including tankers, passenger liners, fishing trawlers, tugs and offshore drilling platforms or progress to a shipmaster (Figure 5.1) who takes the overall responsibility for all those who work and travel on the ship. It takes many years to become a shipmaster.

Courses in the maritime industry can be done through TAFE colleges, private providers, tertiary institutes or the Australian Maritime College (AMC). Facilities at the AMC allow ships officers to be trained on a simulator (Figure 5.2) or study fishing nets in flume tanks (Figure 5.3).

Students who have successfully completed Year 10 will be eligible for most **certificate level** courses such as the Certificate in Fishing Operations, the externally delivered Certificate in Maritime Business and the Certificate in Small Craft Operations. AMC also offers courses in naval architecture for students wanting to learn about ship design (Figure 5.4). In the entry level certificate course in Maritime Operations there are two types of course element: core and elective.

Core course elements

Everyone at sea needs to know how to use the radio, put out a fire in the galley and how to abandon ship. **Core course elements** (previously called modules) of a course are designed so that no matter where you work on a vessel, you are multiskilled in essential safety skills. Examples of these elements are **occupational health and safety**, practical mariners skills, radio operation, firefighting skills and first aid.



Figure 5.1 Shipmaster



Figure 5.2 Ship simulator

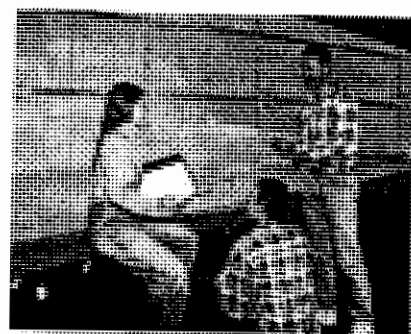


Figure 5.3 Flume tank used to study fishing methods

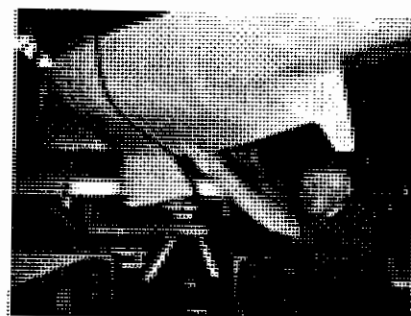


Figure 5.4 Naval architecture model at AMC ready for towing tank

Elective course elements

These elements, allow you to try out different aspects of a certificate level course. Students doing electives are shown in Figures 6.1, 6.2 and 7.1. The students in the engine room are completing competencies in marine engineering on a tug. The student on the whale watching vessel is developing tourism competencies. The cruise attendant, who works for a dinner river cruise business, is taking a bar attendant course. Other elective elements include administration and front office, vessel handling, cargo operations and fishing.



Figure 6.1 Marine tourism crew

Sea time

The maritime industry recognises that experience at sea is fundamental to being a good employee. Every time you go to sea it's a good idea to ask the shipmaster to log time at sea. This is usually recorded in a special seetime log book provided by your local government maritime office. Logged sea time is used as an entry into many maritime courses.

Marine employment opportunities

You don't have to go to sea to work in the maritime industry and over 60 per cent of jobs are shore based. The nice part of the industry is that every now and then you will get to go to sea and having your deckhand qualifications will be very useful.

Tourism

The tourist industry has been our fastest growing industry since the early 1990s. Because of our vast coastline, natural attractions and reliable, warm, weather this rapid expansion has extended into the marine area. **Ecotourism**, based on 'look and leave it alone' ecological principles is the latest tourist boom industry.

Most popular marine tours involve pleasure boats (including cruise boats like that shown in Figure 6.1), snorkelling and diving tours, transport to the tour site (Figure 6.2), larger liner tours, sports fishing tours, whale and whale shark spotting and chartered sailing cruises.

These tourism businesses provide a wide range of unskilled, semi-skilled and fully skilled employment opportunities for people with the requirements already discussed in this chapter, for example elements of shipboard safety and diving qualifications.

Marine tourist centres

This chapter has so far discussed jobs at sea, however there are thousands of shore-based marine jobs.

Marine tourist attractions employ many staff in **interpretive** work. The staff member shown in Figure 7.1 works at Sea World and the photo shows her giving an entertaining, informative and enthusiastic commentary on sea lions to park guests. Some of



Figure 6.2 Ferry transport service



Figure 7.1 Marine interpretation

the jobs at a typical marine tourist attraction centre, of which UnderWater World or Victor Harbour Whale Watching are examples, are listed below.

- **Managerial** — Usually one manager and an assistant manager control daily activities and coordinate staff.
- **Office and clerical** — Secretaries and receptionists handle large volumes of phone bookings and enquiries plus associated paperwork. Completion of a business course and good personal and computer skills are an advantage to getting a job in this area.
- **Technical** — **Curators** help maintain the health of all organisms in a centre by controlling their diets, monitoring water quality and quarantining endangered animals. To get these jobs you need a basic degree in marine biology plus boating and diving qualifications.
- **Trainers** — Training and managing the performance of the seals, dolphins and, possibly, killer whales is a highly specialised job that needs a range of qualifications including bachelor's degrees and extensive experience.
- **Tradespeople** and/or technical assistants — Centres usually need plumbers and fitters or people with maintenance skills to maintain aquariums and service vehicles.
- **Sales assistants** — These centres sell a full range of souvenirs including t-shirts, postcards and ornaments. Jobs are available here for people with good personal communication skills and usually involve shift or part-time work
- **Catering** — Cooking, preparing and retailing snack foods, main meals and coffee and serving alcoholic drinks in licensed sections. You would need to complete a hospitality course and be available for shift work to find a job here.
- **Marinas** — Cleaning and servicing marine craft as well as making repairs and organising stores or trips away.

“Ecotourism, based on ‘look and leave it alone’ ecological principles is the latest tourist boom industry.”

“Most of the jobs in the mariculture industry have traditionally been gained through direct entry with no formal qualifications required”

- **Front desk operations** — Admitting park guests, public relations duties, processing cash or credit cards.
- **Volunteers** — A whole range of opportunities exist here from feeding fish to helping with guided tours.

While you are at school, it's a good idea to apply to be a volunteer because that experience will serve you well if you do intend to work in this industry or a related one. In any case, the skills you pick up will help your employment prospects in any field.

Armed services

The Navy is the part of our armed forces that defends our coastline. It is a self-sufficient organisation responsible for training all its personnel, including tradespeople, and providing university degrees for its officers.

Joining the navy involves passing a medical, showing suitability in an interview, then completing an intense 3-month training course. After being accepted you must make a commitment to sign on for at least 6 years.

After signing on, you will be trained with full qualifications available in a trade or technical vocation. The range of vocations to choose from includes: mechanical fitting, diesel motor mechanics, welding, professional diving, electrical and electronics, radio and radar, chef and all boat-driving qualifications. There is also an officers training course, where initial selection after interview and medical is based on your Year 12 results. You need a high aggregate enter this course.

Fishing industry

In the past, the **commercial fishing industry** caught fish, prawns and lobsters for our tables. Today, because of the combined effects of increasing populations and decreasing fish stocks, the industry is also moving into fish farming or aquaculture.

Most of the jobs in this industry have traditionally been gained through direct entry with no formal qualifications required. For example, people got jobs as general deckhands or untrained labour in fish markets and processing plants. Today, with high unemployment, there is much more competition for jobs and any qualifications obtained are an advantage.

Many useful qualifications such as scuba certificates, radio and small craft proficiency and elements of shipboard safety certificates can be obtained from high school Marine Studies courses.

Figure 8.1 shows teachers and students at Eden High School, New South Wales, demonstrating a safety aspect of their general deckhand course. This course is both accepted and recommended by most Fisheries Departments and is a prerequisite to jobs on seagoing fishing trawlers.



Figure 8.1 Marine safety at Eden High School, NSW

Marine retailing and manufacturing

Water sports

This area includes all the water sports of sailing and power boating, swimming and surfing, jet skiing, sailboarding, diving and fishing. Most of the manufacturers of equipment for these popular recreational activities are small businesses and there are a large number of them in Australia offering a diverse range of employment opportunities.

The makers of boats for jet skiing, sailing and power boating are part of the small boat building industry where many businesses consist of one or two tradespeople, two or three technical assistants, one or two owner-managers and possibly one office secretary. They find it difficult to spare the time to spend with **apprentices** and generally do not take them on without government assistance. There are opportunities for untrained people to get jobs as technical assistants and sales people in retail and manufacturing areas.

Surfboards and sailboards are now either manufactured by a few large companies and distributed to retail outlets for sale, or they are manufactured and sold by an individual retail surf shop. The jobs on the manufacturing side have traditionally been filled by untrained but talented enthusiasts with a vested interest in the industry. There is truth in the saying, 'There's a good surf happening when the surfboard shops are shut'.

The diving industry consists of a few large equipment manufacturers, mostly from the USA, with a large number of retail outlets or dive shops around Australia and New Zealand. Dive shops sell education courses and equipment packages. Jobs in the manufacturing side of diving — making air tanks, buoyancy vests and regulators — are filled by tradespeople such as gas fitters, machinists and technical designers.

On the retail side, a typical dive shop consists of between five and 10 staff, nearly all of them fully or partly qualified instructors who work on a multiskilled basis in which they take turns to teach scuba courses, sell and maintain equipment, and organise and supervise dive trips as in Figure 9.1.

To get a job in this area you should complete basic and advanced scuba certificates under instructors from the diving industry and then seek employment there. As for working in surf shops, the salary is not the greatest and people tend to work there for love rather than money. Surfing and diving are good examples of people working in the marine industry for the lifestyle where the pursuit of wealth is not important.

The recreational fishing industry also revolves around a few manufacturers of equipment and accessories. Available jobs are mostly for unskilled people in the sales area. There are now, however, an increasing number of fishing and tackle shops putting together specialised equipment 'rigs' and organising extended

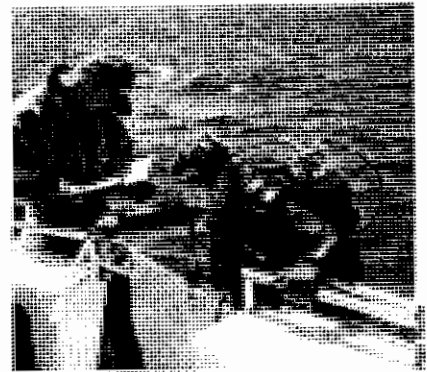


Figure 9.1 A divemaster safety checking a returning scuba diver

“Surfing and diving are good examples of people working in the marine industry for the lifestyle where the pursuit of wealth is not important.”



Figure 10.1 Boat manufacturing

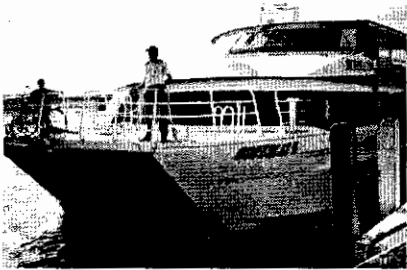


Figure 10.2 Western Australian-made ferry

“The best chance for school leavers to get jobs at companies like Austal is in the trades area”

fishing tours. This will open up job opportunities for semi-skilled fishing enthusiasts.

Boat and shipbuilding

Boats and ships can be made from aluminium, wood, fibreglass, concrete, steel and, most recently, composites of high technical plastics such as kevlar.

Boat and shipbuilders or **shipwrights** usually specialise in a certain material in their construction processes. Most use only one or two materials. The jobs in this industry are mostly for welders, carpenters, machine fitters and electricians.

Examples of successful shipbuilders are Austal Ships in Western Australia and INCAT in Tasmania which are two of the world’s biggest manufacturers and exporters of large passenger ferries. These ferries, mostly twin-hulled, 40 m aluminium catamarans, can carry up to 300 passengers (Figure 10.2).

Austal employs 670 people in a tiered management structure with many sections, under a chief executive officer. The major sections of management are production, fit-out, engineering, construction, electrical and design. Austal’s staff are a range of professional, skilled and general employees including accountants, naval architects, engineers, tradespeople, trainees and apprentices, sales persons, secretaries and clerks.

The best chance for school leavers to get jobs at companies like Austal is in the trades area. More than 365 people in this company, over half of the total staff, are employed in the aluminium, electrical and engineering sections.

This includes 106 apprentices and 32 trainees in the aluminium fabrication, marine fit-out, electrical, refrigeration, sheet metal and welding trades.



Figure 10.3 Boat building business

Most of Austel's technical staff are recruited directly from school after completing Year 10 with good passes in mathematics and English.

Other trades such as electrical and refrigeration engineering need successful completion of Year 12. School reports are considered with particular attention paid to an applicant's record for absenteeism, behaviour and ability to work independently to full potential. Apprentices take three years to qualify in their respective trades, working four days a week with on-the-job training, plus one day a week in formal off-the-job training (for example TAFE).

Most coastal cities have a large number of small boatbuilders, some of whom are willing to take on apprentices (Figure 11.1).

The builder in Figure 10.3, Ally Craft, employs an office manager, a clerical assistant, and 17 staff who are involved in welding, a forklift operation, metal cutting and fabrication. The company turns out about 90 boats a month and sells its product all over Australia and to overseas.

Marine science

There are few jobs as marine biologists. However marine science offers many careers in education, research and technology. The research field covers all the science disciplines of biology, chemistry, geology and physics plus related fields of engineering, geography and mathematics. Professionals in these fields are involved in research in fisheries, oceanography, archaeology and seafood technology. There is a great deal of fisheries research currently going on into aquaculture, the breeding and growing of marine animals under controlled conditions. Up until 1990, oysters and yabbies were the only significant species under aquaculture.

Since 1990, many other species have been farmed successfully, especially the larger fish such as barramundi and tuna, and lobster. The bulk of the research concentrates on finding the best diets and conditions to grow the species to suitable sizes for sale. The qualifications required for jobs in this area are at least a basic university degree, with most researchers needing a doctorate in science.

All the above research fields require administration and technical support to help collect and distribute data. There are a wide range jobs for semi- and fully trained personnel including laboratory assistants, boat skippers, deckhands, computer programmers, office clerks, secretaries, marine park rangers and divers.

Education

Employment in teaching Marine Studies courses can be found in high schools, TAFE colleges, universities and private providers. You will need to complete Years 11 and 12 with good grades to begin to qualify for any job in this area.



Figure 11.1 Marine scientist in laboratory

“Marine science offers many careers in education, research and technology.”



Figure 11.2 Marine scientist in the field

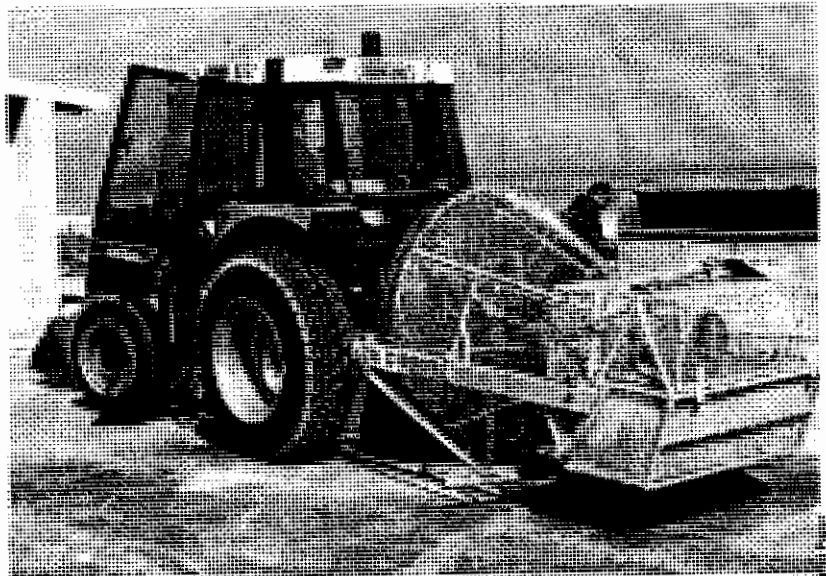


Figure 12.1 Beach litter control operator (Perth)

“Local authorities often employ lifeguards to patrol beaches. Lifeguard positions are usually filled from the ranks of the voluntary surf lifesaving movement.”

There are two types of qualification to be a high school teacher. You must either complete a three-year bachelor’s degree course in a range of major subject areas such as marine biology plus a one-year diploma in education or complete a four-year Bachelor of Education course at a recognised university.

To widen your skills and improve your employment prospects in marine teaching, a number of short duration certificate courses are available on a part-time basis. Scuba diving, sailing and small craft proficiency courses, for example, can each be completed in four full days or over two weekends.

The marine courses at most tertiary colleges are split into the two main areas of fishing or scientific. Teachers in the fishing area are either ex-secondary teachers with sea skippers and masters qualifications or they come directly from the maritime industry such as ex-fishing boat skippers or shipmasters who have completed a bridging teaching course. Teachers of scientific subjects such as marine biology and aquaculture usually have masters degrees or other post graduate university qualifications. Similarly, in universities, all lecturers need a PhD, which takes at least four years of research in a highly specific area.

Local government

Local authorities often employ lifeguards to patrol beaches. Lifeguard positions are usually filled from the ranks of the voluntary surf lifesaving movement. Other jobs at the local government level involve beach litter control (Figure 12.1), for which you would need to have a tractor licence, or jobs in water quality environmental monitoring where you would be responsible for controlling stormwater pollution on beaches. Ultimately the protection of our marine environment will depend on how well the rules are enforced.

Harbours and port authorities

Australian ports involve a number of state and federal government departments including the port authority, customs service, water police and transport departments. Collectively, they are responsible for shipping movements, loading and unloading goods, maintaining and enforcing marine qualifications and safety regulations and prohibiting the import/export of illegal goods.

Port authorities control the movement of ships into and out of ports and are responsible for overseeing the loading and unloading of ships, called **stevedoring**. In some ports the stevedoring is contracted out to large companies.

The following is a list of the jobs available in this area and the qualifications needed.

- **Managerial** — Control of operations and staff. Most employees at this level have tertiary qualifications and a good deal of experience.
- **Office/clerical** — Deal with the large volumes of necessary paperwork. Employees have usually completed Year 12 .
- **Service** — Drive and maintain vehicles such as forklifts, cranes and boats. Most people employed here are mechanical and electrical tradespeople and their semi-trained technical assistants.
- **Stevedoring** — Handle goods such as cars, trucks, containers, bulk grains, petroleum and livestock. These jobs are mostly unskilled and need no formal qualifications. Some are semi-skilled and get their qualifications through on-the-job training and short courses such as crane driving provided by outside contractors (Figure 13.1)

“Port authorities control the movement of ships into and out of ports and are responsible for overseeing the loading and unloading of ships, called stevedoring.”



Figure 13.1 Working as a trainee in a port

“To become a customs officer, you can apply to sit a Commonwealth public service exam after completing Year 12. ”

- Security — Protect goods awaiting export or pick up. Most security personnel require limited qualifications involving a short TAFE course with most training on the job.

The customs service is a federal government department which prohibits the export and import of illegal goods and substances. To become a customs officer, you can apply to sit a Commonwealth public service exam after completing Year 12.

Water police are attached to state police departments. Their role is similar to any other type of police except their responsibility extends to all waterways. Entry requirements are similar to the customs service.

State government transport departments’ involvement in the marine area makes them responsible for setting and enforcing ship driving qualifications, safety and survey requirements and zoning water-based activities such as jet skiing.

To become a department of transport officer in the marine area, you will need to sit and pass a public service exam, then train on the job, gaining relevant boating qualifications.

All the departments discussed here have a considerable support staff of managerial and clerical personnel who deal with all the administration. There are also a number of external agencies, such as private contractors who have direct roles such as tugboat owners and pilots and indirect roles (for example, vehicle servicing), other maintenance companies, manufacturers and retailers of a large range of marine safety equipment in major ports in marine administration.

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