

This Information was written and compiled by Rachael Bathgate, Reef Watch coordinator 2001.

How Does Reef Watch Work?

Participating divers are supplied with information, training material and assistance from the coordinator to help undertake surveys of Victorian dive sites as part of their normal diving activities. Divers choose their own sites and are responsible for all their own transport, equipment, tank fills and safe diving practices. During the dive data is entered into a datasheet and the resulting information forwarded to the coordinator.

Participants use a Reef Watch Kit which consists of:

- Laminated photo identification sheets for key fishes, invertebrates and plants.
- Reusable waterproof data sheets.
- A perspex slate to attach data sheets.
- Pencil.

Learning how to identify Victorian marine life

The information collected during a dive is only of value if it is accurate. The biggest task for participating divers is to develop the skills to identify Victorian marine life. The following section outlines ways in which divers can improve their identification skills.

The Reef Watch photo identification sheets are provided to help you become familiar with different groups or species. There are obviously many more species than represented on these sheets. Books, the Reef Watch website and other websites (as listed in the appendix) may all help in developing identification skills. Graham Edgar's book *Australian Marine Life* (1997) is an excellent overview of marine plants and animals found in southern Australian waters. Request it from your local library.

It is difficult to know where to start with such a large array of animals and plants living in our waters. Do it in stages. Start with a distinct group such as starfishes, colourful sea slugs, larger fishes or large brown seaweeds. Take notes, do sketches on the back of your slate. Take your time - quality data on a particular group is more valuable than lots of inaccurate information. Data sheets are provided with a column in which you can state how certain you are that your identification is correct (tentative or confident t/c).

Some groups are hard to identify. With time you may want to specialise. For instance, weedfishes (family Clinidae) or members of the green seaweed genus *Caulerpa* are difficult to identify. For keys or further information on difficult groups, contact the Reef Watch coordinator.

The Reef Watch website will contain running checklists for each region and a total checklist for species observed in Victorian coastal waters. Divers can always check if a species has previously been reported from their regions. With time and funding we

hope that Reef Watch will be able to run identification classes for participating divers both in Melbourne and across the State.

Common and scientific names

The common names listed on the data sheets each correspond to a particular species of plant or animal. Both the common names and their matching scientific names are listed in the species list provided in the appendix.

Common names vary along our coastline and what one person calls a “rocky” in one place is called a “parrotfish” in another. Scientific names are a way of fixing a single two-part name to a single species. The first part is known as the *genus*. All gum trees are in the genus *Eucalyptus*. The second part is the *species* name, just for that single species. The Mountain Ash is *Eucalyptus regnans*, hence the species name for this gum tree is *regnans*.

Some groups have no common names and are thus listed by their scientific name. These are presented in *italics*. Hence *Phyllospora* is the genus name for a brown seaweed. The lack of common names for many of our Victorian marine species shows how little we observe or know of our sea life. With time common names will be coined for many of the more common species.

How to Fill Out Your Data Sheet

Several categories of information will be collected through this program: site and dive details.

- habitat description and substrate (bottom) type.
- checklists of native animals with some measure of abundance (1-5,5-20, >20).
- checklists of native plants and animals with some measure of abundance (sparse, medium, dense).
- presence and abundance of exotic (introduced) creatures.

All five categories are included on the waterproof data sheets which can be obtained from the coordinator. An explanation of each section is provided below. For each dive, it is essential that the following details are recorded:

Site and Dive Details

Divers name(s) This is important as it enables us to check the accuracy of data and build up a picture of trends in the data over time.

Contact (phone/email): This allows us to check details if there are any questions - a phone number or email is the fastest way however a postal address will also be adequate. If you have already provided us with your up-to-date contact details you need not supply them again.

Date: Time of year allows us to monitor seasonal changes.

Time: Helps separate different shifts of animals: day-active, nocturnal or dusk/dawn species.

Duration of survey: Longer dives may collect more data. This gives us an indication of the scale of the survey.

Dive Location: Must be in enough detail to allow mapping of the data. Describe the distance and direction from the nearest town.

Lat/Long: Latitude and longitude. This allows data to be mapped with more accuracy.

Depth range of survey: Only show the range during which data was collected. You may want to concentrate on shallow species some dives, deeper species on other dives.

Visibility and Swell: Conditions may affect the number of creatures recorded. Absence of fish in perfect diving conditions is a different result from a zero-visibility dive where no fish were seen.

Major Substrate Type

In this section note down the major substrate or bottom type during your survey. If there appears to be more than one major substrate type that you are counting over, then indicate this with a tick for each substrate.

Large rocky reef: Having rock faces or ledges over 50 cm high.

Low rocky reef: Has rock faces or ledges less than 50 cm high.

Rubble: May be made up of rocks, shells or corals.

Pier/Sand/Mud: Self explanatory.

Other features (e.g. gutters): The complexity of a site often influences the type and number of species that live in an area.

Major Cover for Whole Site (s – sparse, m – moderate, d- dense)

These measures are relative and are likely to vary with species i.e. some naturally grow more dense than others. They will also vary according to the person making the assessment. Take a guess based on your experience on other dives and try to be consistent. Take photographs if you can for your own reference. Remember: s, m and d are an *average* for the whole dive area.

Kelp: Kelps are larger, brown algae that often form a single-species canopy or 'forest' underneath which other plants and animals live. Kelps are characterised by

round stems called stipes, large, leaf-like fronds and a holdfast which secures the plant to the bottom. Further abundance estimates for specific kelp species are entered in the data table.

Mixed algae: Different algae often grow together without one particular species dominating. For example, brown algae such as *Cystophora* and *Sargassum* may grow together on reefs with related species such as *Caulocystis*. Many of these plants do not have common names unlike the more familiar kelps and seagrasses.

Seagrass: Seagrasses are flowering plants that may form extensive beds, particularly in bays and inlets. Seagrasses such as Swan Grass grow more densely than forms like Paddleweed.

Invertebrates (e.g. sponges): In deeper or darker waters where little light penetrates, invertebrate animals such as sea squirts (ascidians), sponges and sea whips are often the dominant forms. Such assemblages are often called 'sponge gardens' and usually cover hard surfaces such as reefs, however, they may also grow in rubble or sand.

Encrusting coralline algae: This appears like a pink splash of paint and is very common in Victoria. In some instances it may be the predominant cover over a reef, sometimes as a result of seaweed grazing by urchins such as the Black Sea Urchin (*Cetostephanus rogersii*) which occurs west of Cape Conran.

Other: Victoria has a diverse array of habitats beyond those listed above. For example, green algae such as Bubble Weed (*Caulerpa cactoides*) may form extensive beds in areas of Westernport Bay. List other habitats like this here if they dominate in your survey area.

Fish Data

Use the photo identification sheets to identify fish encountered during the dive. If you come across fish that are not on these sheets, use the back of your slate to draw the main features of the fish. Pay particular attention to the position of the eye, the shape of the mouth and the number, shapes and arrangement of fins. After your dive use the fish books listed in the references section or contact your **Reef Watch** coordinator for help with new fishes or to be sent relevant sections of fish identification books. With time the photo sheets will be updated to include as many Victorian fishes as possible.

Confidence in your identifications: Some Victorian fish species are very distinctive. Others are much harder to identify as there are other species which are similar in appearance. The first column on the data sheets after the species names allows you to state whether you are confident in your identification or if it is just a tentative identification. Use a (t) for tentative and a (c) for confident. As your identification skills improve you will find more and more of your identifications are valid.

Abundance: Three columns are provided on the data sheets to estimate the abundance of each species encountered. The counts are for the entire dive. If more

individuals are seen through the dive simply cross out the lower category and tick the higher category.

Note: For all fish, invertebrate and plant species, mark '0' if you were actively looking for a particular species but didn't find it. For example, you may be looking for Variable Sea Stars in an area where you usually find them but on this occasion you don't see any - put a '0' in the 1-5 column.

Data on Plants and Invertebrates

Invertebrates and introduced pests are scored the same as fish. Again, it is important to mark 0 if your active search efforts don't reveal the species you were looking for.

MARINE PLANTS	t/c	s	m	d
* Mark with cross OR write species code from photo ID sheet				
Large Brown Leathery *Species code: CK, SK, S, BK,CW	c	CK		
Brown Branching *Species code: Sg, C, A	c			X
Green Branching *Species code: FW, BW, SV				
Red Fleshy	t		x	
Branching Coralline				

Plant cover is measured according to three broad categories: sparse (**s**, <5% of seafloor cover), medium (**m**, 5-40% of seafloor cover) and dense (**d**, 40-100% of seafloor cover).

Identify marine plants according to one of the categories in bold e.g. **Brown Branching** and mark the appropriate level of cover. If the species of plant is know, as shown on the photo ID guide, mark down the cover of that species with the appropriate species code. For example, the above data sheet showed the site had a dense covering of Brown Branching algae, a medium coverage of Red Fleshy algae and a sparse covering of Large Brown Leathery algae, which the diver was able to identify as CK (Common Kelp). You may put more than one species down for each of the broad categories (e.g. sparse CW & sparse S).

For species not presented in the photo sheets, make notes on the back of your slate. After your dive use the books listed in the references section. There are many more plants and invertebrates than fishes in Victoria so it will take time to start recognising the different groups and to develop identification skills. For seagrasses look for a proper root system and distinct leaves and stems. Leaf shape is important. For seaweeds (algae), look at the colour and any distinctive floats or branching patterns. For further help contact your **Reef Watch** coordinator. Supplementary notes on the

major plant and invertebrate groups are currently being produced. With time the photo identification sheets will be updated to include as many of the larger Victorian marine plants and invertebrates as possible.

Introduced Pests: One introduced kelp (*Undaria*) and two introduced animals (Mediterranean Fan Worm and North Pacific Sea Star) are highlighted in red on the photo identification sheet. One of the aims of **Reef Watch** is to provide early warning reports on the appearance or spread of such pests which have been introduced from the ballast water of cargo ships. Abundance information may also provide critical information on the spread and impacts of these creatures.

Doing the Reef Watch Dives

SAFETY NOTICE:

Reef Watch is a program where divers are encouraged to gather information through their normal diving activities. Safe diving practices are essential and **Reef Watch** takes no legal or other responsibility for the diving activities of the participants.

- All SCUBA diving participants must be fully trained, qualified and medically fit.
- Always dive in buddy pairs, always in sight of each other.
- Watch bottom time and air consumption as it is easy to be distracted recording the wildlife.
- Let people know where you are going and when you are due back.
- Always use regularly serviced gear with all necessary safety equipment.
- Avoid decompression dives and always add a safety margin/extra safety stops.
- Always avoid damage to substrate or marine life. Be careful not to dislodge animals and plants attached to rocks or the seafloor. This can easily be done with fins or trying to push aside heavy kelp to see in crevices and ledges. Don't take samples: take a slate and make notes or drawings to aid identification when back on dry land.

The three steps for a Reef Watch dive:

1. Choosing a site

As **Reef Watch** is interested in marine life along the entire coast of Victoria, sites can be anywhere from bays and inlets to the open ocean. You can monitor the cycles of your local favourite dive site or help us expand our knowledge of other areas of the Victorian coastline.

Always thoroughly investigate your dive sites. If you have not dived them before try to find local knowledge on the safest/best places. Identify safe entry and exit points. If the conditions are too rough or the currents too strong, choose a safer site or delay the dive until conditions ensure a safe dive.

2. Planning the dive

Before getting in the water divide up the tasks between yourself and your buddy. One way is to split up the photo identification and data sheets so that one diver does the fishes, the other the invertebrates and plants. If you are concentrating on a particular group do some notes and sketches on your slate before the dive.

As many larger fishes are easily startled by divers it is best to start with a general look around the dive site. In general plan to start macro and go micro. The first few minutes are often the best time to see larger pelagic fishes or other flighty fishes. You can then concentrate on the more hidden creatures such as animals hiding amongst the seaweeds or seagrasses. Try sitting quietly in one spot and see what animals emerge from cover. Finish with a look deep within ledges or crevices. A torch aids in these searches.

As many animals only emerge from hiding at night, try diving the same locations at night to record these nocturnal species. As stated above, only dive when the conditions allow a safe dive. Rock pools or piers in sheltered bays make ideal night dive locations.

3. Doing the dive and recording information

When you arrive at the site fill in all your details and the details of the location, date, time and conditions. Also record the number of fishes you can see on the surface at the start of your dive.

During the dive fill in all the habitat information. As you identify animals or plants specify whether your identification is tentative (t) or confident (c). Tick the section applying to the creature's general abundance.

NOTE: Put '0' in the 1-5 column if you looked for, but did not find, a specific species.

For creatures not covered in the photo identification sheets, make notes and sketches on the back of your slate. These will aid identification after the dive.

Always note any special life cycle phenomena, unusual behaviours or aggregations of animals. These could include the flowering of seagrasses, breeding aggregations, courtship and nesting behaviour, or the appearance of unusual transient species (such as sea snakes, paper nautilus or Antarctic seals). After the dive, fill in all the sections which summarise the dive, such as visibility, survey depths and survey duration.

Submitting Data from a Dive

After your dive transfer all information on to a regular paper versions of the dive sheets. The easiest and most accurate way to do this is to photocopy the sheet. If not, transfer the data by hand. It is best to do this as soon as possible after the dive

while your memory is fresh. Also look up your reference sources for any unidentified species as soon as possible, using your notes and sketches as an aid.

Check that all writing on the data sheets is legible. Once the data has been copied down, dry the reusable plastic data sheets and clean off the writing using a soft rubber eraser.

Send the copied data sheets by mail or fax to:

Reef Watch Coordinator Marine Invertebrates Melbourne Museum GPO Box 666E, Melbourne, Vic 3001. Phone: (03) 8341 7446	Mark: Attention Reef Watch Coordinator Reef Watch Victoria Melbourne Museum FAX: (03) 8344 7705
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Direct entry of data through the **Reef Watch** website is currently being developed.

What Happens to the Information?

The information gathered by **Reef Watch** divers will be used in a number of ways. The **Reef Watch** coordinator will assess tentative identifications and provide feedback to divers seeking more information on difficult groups. Once identifications have been confirmed, running checklists will be developed for each site. Summaries will be developed for each region and a total checklist for Victorian waters will be produced.

Seasonal information will also be amassed so that the yearly cycles of key species can be examined and described. Special natural history events will be documented (for example cuttlefish mating) to build a picture of key life cycle stages of many of our poorly-known marine species.

All information will be entered into a central database with the summaries posted on the **Reef Watch** website, distributed through newsletters or made directly available to participants.

As the database grows analysis will allow description of abundance trends over time, distributional trends across the state and affinities of particular groups with other regions (ie, cold water or warm water affinities). All data will contribute to a greater understanding of the wildlife of our rich waters.

Reef Watch as an Information Source

A primary aim of **Reef Watch** is to disseminate both the data gathered through this project as well as existing information on Victorian marine life. This will mainly be provided through the website, information provided in the introductory kit and regular newsletter articles.

Participating divers will be able to get information directly from the website. As many divers in remote regions may have difficulties accessing the web there quarterly

newsletter updates will be sent via post. Direct feedback can also be obtained by phoning, faxing or writing to the **Reef Watch** coordinator.

Reef Watch information will be available to the general public, government bodies, new divers - anybody interested in Victoria's marine life. This will primarily occur through the website. The website will also be a site for provision of appropriate information including:

- Sources of natural history information
- Conservation announcements
- Regulations relating to Victoria's marine environment.
- Fisheries contact details
- Government announcements
- Contact details for conservation groups
- Contact details for marine research groups
- Contact details for marine natural history groups
- Contact details for dive clubs
- Notice board for announcing meetings, special events or training weekends.