Great Victorian fish count 2024





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Great Victoria Fish Count 2024

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The Victorian National Parks Association (VNPA) is an effective and influential nature conservation organisation.

We work with local communities, scientists and government to advocate for evidence-based policy to safeguard wildlife, habitat and protected areas. We inspire connections with nature through citizen science, activities, action and education for all Victorians.

We've led the creation, oversight and defence of Victoria's natural estate for over 70 years.



ReefWatch is VNPA's marine citizen-science program. It runs the Great Victorian Fish Count and the Sea Slug Census. It trains people to collect important information about fish, invertebrates and algae at locations across Victoria.

VNPA acknowledges the many First Peoples of the area now known as Victoria, honours their continuing connection to, and caring for, Country, and supports Traditional Owner joint-management of parks and public land and waters for conservation of natural and cultural heritage. We offer our respect to Elders past and present.

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Executive summary

The 2024 Great Victorian Fish Count (GVFC) brought together over 500 citizen scientists from 30 groups, completing 65 surveys across 38 coastal sites in Victoria. Surveys were carried out at depths ranging from 2–35 metres in varying conditions, with most surveys conducted by scuba divers (65%) and snorkellers (34%).

Survey sites spanned a range of habitats, with rocky reefs (60%), sandy or muddy areas (63%), and artificial structures (52%) frequently recorded. Mixed algae was the most common vegetation type (81%), followed by sponge gardens, seagrass meadows, and kelp forests. Despite Victoria's Marine Protected Areas covering only 5.3% of marine waters, 17% of surveys were conducted within these zones, reflecting their popularity and ecological value.

Key species observations

- Blue Throat Wrasse was the most frequently observed species, appearing in 90% of surveys, usually in large groups.
- The Herring Cale, the 2024 'face' of the GVFC, was observed in 32% of surveys, with numbers remaining consistent over the past decade.
- Other commonly sighted bony fish included Magpie Perch (71%), Zebra Fish (65%), and Victorian Scalyfin (60%) with Scalyfin sightings notably increasing from 2023.
- Less common bony fish sightings included Ornate Cowfish, Western Blue Groper and Bastard Trumpeter. Harlequin Fish were not sighted this year.

Sharks and rays

- The Smooth Stingray remained the most commonly sighted elasmobranch (40%), followed by the Southern Fiddler Ray (32%) and Spotted Stingaree (26%).
- Notably, Spotted Stingaree sightings increased to their highest rate since the Fish Count began.
- Species like Spotted Wobbegong and Elephantfish were not recorded in 2024.

Comparisons with previous years

- Most bony fish sighting trends remained stable, with notable rebounds in Horseshoe Leatherjacket sightings and a continued decline in Six-spined Leatherjacket observations.
- Shark and ray sightings were generally in line with historical trends, though some variability was noted between years.

Noteworthy insights

- Rocky reef habitats and golden kelp were prominent in survey sites, reflecting growing awareness of the Great Southern Reef's ecological importance.
- Participation across snorkel and dive groups remained strong, highlighting the enduring commitment of Victoria's marine citizen science community.



This you? Matt Rattlepiece conducting the 2024 Great Victorian Fish Count Elodie Camprasse



GVFC group at Barwon Bluff Mark R

Gurnard Perch Jane Bowman

1. Introduction

1.1 Background

The Great Victorian Fish Count (GVFC) is Victoria's largest marine citizen science event, bringing together ocean lovers of all experience levels to explore and document our incredible underwater world. Held every November and December, this event gives participants the chance to dive beneath the surface, discover local marine life, and contribute valuable data on fish species along our coastline.

Whether you're new to diving or an experienced underwater explorer, the GVFC offers a unique opportunity to connect with nature while helping to protect our marine environment. Dive clubs, environmental groups, schools, universities, community organizations, and beginner-friendly groups all take part, creating a snapshot of fish diversity across Victoria's coastal waters.

Victoria is home to a rich variety of marine life, with many species found nowhere else in the world. Nearly a quarter of Australia's fish species are unique to our waters, and 60% of these live only in the southern seas (Bray, 2018a). By recording fish sightings, volunteers help scientists track changes in species numbers and distribution over time.

More than just a fun day in the water, the GVFC encourages people to learn about marine ecosystems, contribute to important research, and build a stronger connection with our oceans. The information collected supports conservation efforts and helps scientists and government agencies better understand and protect our unique marine life.

1.2 Citizen science

Citizen science provides community members with the opportunity to contribute to scientific research by collecting data and participating in project development. It also provides a valuable opportunity for people to learn from one another while making a meaningful impact.

The GVFC brings together scientists, marine managers, divers, snorkellers, and local community members to expand our knowledge of fish species found in Victorian waters. By working together, participants help track fish populations and better understand changes in our marine environment.

In 2024, more than 500 participants took part in the GVFC, recording fish sightings along Victoria's coastline. With so many people involved, a vast amount of data was collected on fish distribution and abundance - data that would be nearly impossible to gather without community support.

The success of the GVFC highlights the power of citizen science in contributing to marine research. By working together, volunteers and scientists can gather critical information to support conservation efforts and protect Victoria's unique marine life.

1.3 Partnerships with local communities

For over 22 years, the Victorian National Parks Association (VNPA) has led the GVFC in collaboration with Museums Victoria, Parks Victoria, Coastcare Victoria, dive operators and local community groups. These partnerships have been essential in expanding the reach and impact of the event.

In 2015, Redmap joined as a partner, further strengthening the project's ability to monitor marine species. This collaboration continued in 2024, adding valuable expertise to the initiative.

Each partner plays a crucial role in the success of the GVFC by contributing:

- scientific expertise
- communication skills and outreach knowledge
- local, regional and state-level understanding of coastal habitats and fish species
- strong connections within local communities and networks
- specialised skills and qualifications for leading diving and snorkelling trips.

This collaborative approach has been key to the long-term success of the GVFC. We are grateful for the ongoing support of our partners and look forward to continuing to work together to protect and better understand Victoria's unique marine life.

1.4 The 'face' of GVFC 2024

The 'face' of the 2024 Great Victorian Fish Count (GVFC) was the striking Herring Cale (Olisthops cyanomelas), a colourful species of wrasse commonly found on rocky reefs across southern Australia (Australian Museum, 2025).

Beyond their visual appeal and ecological significance, Herring Cale are fascinating from a reproductive standpoint. Unlike many other wrasses that change sex during their lifetimes, Herring Cale are gonochoristic - each individual is born either male or female and remains that way for life (Kawase & Sunobe, 2023). This trait is relatively uncommon among FISH

wrasses and offers valuable insights into reproductive diversity in reef fishes.

As herbivores, Herring Cale play an important role in maintaining the balance of algal growth, contributing to the resilience of southern temperate reef ecosystems. Though not always easy to spot, their presence among kelp beds is a good sign of a healthy reef and it is encouraging that number of sightings have been steady over the past ten years during the GVFC.

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1.5 The Atlas of Living Australia

Data collected during the GVFC is entered into the Atlas of Living Australia (ALA), a national database that compiles biodiversity information from various sources, making it accessible online. This allows scientists, researchers, and the public to explore and use the data to better understand Australia's biodiversity.

Submissions are made through BioCollect, a tool designed to support citizen scientists, ecologists, and natural resource managers in gathering and analysing environmental data. Given the limited information on marine species distribution in Victoria, the GVFC plays a crucial role in filling knowledge gaps.

To date, GVFC records have been accessed more than 1.1 million times for research and educational purposes, highlighting the valuable contribution of citizen science in monitoring and learning about Victoria's unique marine ecosystems.

1.6 Unusual sightings and identification

During the GVFC, we received reports of species spotted outside their usual range. However, without accompanying images, we are unable to verify these sightings or report them to Redmap, which tracks changes in marine species distribution.

To improve data accuracy, we encourage participants to submit photos with their survey data, particularly when recording uncommon species. Photographic evidence helps confirm sightings and enhances the reliability of our datasets.

To support this, ReefWatch offers underwater cameras for loan, especially during the GVFC. These cameras help groups capture clear images for verification while also providing an opportunity to practice underwater photography skills.



Fish counting at Pope's Eye, Port Phillip Bay/Nerm Elodie Camprasse



Female Herring Cale Friends of Beware Reef

2. Methodology

2.1 Survey period

The 2024 GVFC began on 16 November and finished on 15 December.

The dates were chosen to coincide with national Coastcare Week, which is held in the first week of December. The fish count will continue to be held during the November/ December period to allow for comparison of results with previous years.

2.2 Site selection

Sixty-five surveys took place along the Victorian coastline (Fig. 1), with participating groups choosing their own sites. To ensure continuity in the data over time, groups are encouraged to select a site they are most familiar with and continue to monitor that same site each year.

While most sites surveyed were in and around Port Phillip Bay and Western Port, it is always encouraging to see more locations in the east and west of the state.

2.3 Kit and survey method

Each participating group leader is provided with a standard GVFC Kit, which includes training materials to help participants learn how to conduct a fish count.

The kit also contains identification slates (see Appendix), survey forms, and instructions on how to upload data, ensuring a smooth and efficient survey process.

The 'roving diver' technique

Participants conduct the survey using the roving diver technique, which allows them to freely explore their chosen site while recording fish sightings.

Each buddy pair or small group shares a slate and follows these key guidelines:

- Swim through the area without a fixed path, covering a wide range of habitats.
- Avoid overlapping with other buddy pairs to maximise coverage.

Jawbone Marine Sanctuary $^{\Delta ullet}$ Crystal Steps 100km 20km (Williamstown) ARicketts Point Marine Sanctuary Point Cooke **GVFC 2024 survey site** Marine Sanctuary **Marine Sanctuary Marine National Park** Daveys Bay St Leonards Pier Mornington Pier French Island Birdrock Beach Pt Lonsdale Pope's Eye South Channel Fort Barwon Portsea Pier Rosebud Bluff Merricks Ck Mouth Blairgowrie Rye Pier Marine Somers Sanctuary Lonsdale Wall Flinders Pier **Bushrangers Bay** San Remo Jetty Kitty Millers Bay Cape Woolamai George Kermode -Gabo Island Cape Conran **Beware Reef** Marine Sanctuary Torquay Portland. Port Fairy Lorne Pier Cape Paterson Port Campbell

Fig. 1: GVFC 2024 survey sites

• Stop regularly to observe fish that may be hiding or have been temporarily disturbed.

During the survey, observed fish species are placed into one of three abundance categories on the identification slate (Fig. 2). Each category has a corresponding symbol, which is progressively marked off as more individuals of that species are recorded.

This standardised method ensures consistency in data collection, ensuring the GVFC is a valuable tool for monitoring fish diversity along Victoria's coastline.

2.4 Recording and submitting data

At the end of each survey, all participating buddy pairs and groups come together to complete the GVFC data sheet. This form captures key details about the survey, including location, weather conditions, water visibility, and time spent conducting the count.

The data sheet lists the 35 target fish species, with space to record additional species if observed. For each species sighted, an abundance category is selected, based on the average results from all participating groups. Completing the form immediately after the dive ensures accuracy and allows participants to review their findings together.

Once completed, groups can submit their results by email or directly through the ALA database, where photos can also be uploaded. Many participants find the online submission process quick and straightforward,

and VNPA continues to encourage the use of this method to streamline data collection and analysis (Fig. 3).

2.5 Understanding the 2024 GVFC results

This year's results provide an overview of the main habitats surveyed, the methods used, and the occurrence and abundance of fish species recorded in 2024. To track changes over time, these findings are also compared with data from previous years.

The results are displayed as proportions, calculated using the formula: Proportion = (number of surveys in which a species was sighted) ÷ (total number of surveys conducted). A value of 1 means a species was recorded in every survey, while 0 indicates it was not observed at all. This method allows for a quick comparison of species frequency across surveys.

All GVFC data is available through the Atlas of Living Australia (https://collections.ala.org.au/public/show/dp3777).

Each year, some survey records are not uploaded to the ALA, despite being successfully completed in the field. To ensure all data contributes to official records, we encourage every participating group to submit their results and reach out to the GVFC/ ReefWatch coordinator if they encounter any issues with data submission.



Fig. 2: Abundance categories

GVFC Survey Form Red Watch Victoria						
	x 666, Melbourne, VIC 3001 • Ph. 03 8341 7446 • www.ree	fwatchvic.asn.au · info@reefwatchvic.asn.au				
Registration Details		D : 4 4: 10				
Dive Group (registered dive operator/friends g	roup):	Registration №:				
Site Details						
Site name:						
Location:						
Latitude	Longitude					
	S					
If using a GPS, please use WGS 84 DATUN	1					
Site Description Habitat (tick all that apply):		·				
Large Rocky Reef (>2m face)	Low Rocky Reef (<2m face)	Rubble				
Artificial Reef (eq. pier, wrecks)	Sand/Mud	Other				
		_				
Type of cover (tick all that apply):						
_						
Kelp (long, leathery brown algae	e) Mixed algae	Seagrass				
Sponges, seasquirts & other	Other					
If Other, please describe:						
If Other, please describe:						
If Other, please describe:						
if Other, please describe:						
·						
Site Conditions	the day of the survey					
Site Conditions The following are the site conditions on t	the day of the survey Time start:	Time finish:				
Site Conditions The following are the site conditions on t		Time finish:				
Site Conditions The following are the site conditions on t		Time finish:				
Site Conditions The following are the site conditions on t		Time finish:				
Site Conditions The following are the site conditions on t Date of Survey:	Time start:	:				
Site Conditions The following are the site conditions on t Date of Survey:	Time start: 24 hr time Max. Depth: Visi	: 24 hr time bility: Water Temp.:				
Site Conditions The following are the site conditions on t Date of Survey:	Time start:	24 hr time				
Site Conditions The following are the site conditions on t Date of Survey:	Time start: 24 hr time Max. Depth: Visi	: 24 hr time bility: Water Temp.:				
Site Conditions The following are the site conditions on to bate of Survey:	Time start: 24 hr time Max. Depth: Visi	: 24 hr time bility: Water Temp.:				
Site Conditions The following are the site conditions on to bate of Survey:	Time start: 24 hr time Max. Depth: Visi	: 24 hr time bility: Water Temp.:				
Site (anditions The following are the site conditions on t Date of Survey:	Time start: 24 hr time Max. Depth: Visi	24 hr time Water Temp.: m °C				
Site (anditions The following are the site conditions on t Date of Survey:	Time start: 24 hr time Max. Depth: Visi	24 hr time Water Temp.: m °C				

Fig. 3: Slate data forms

VICTORIAN NATIONAL PARKS ASSOCIATION DO Ber 65	GVFC Survey Form Reef Watch Victoria 686, Mebourne, ViC 3001 - Ph. 08 841 7446 - www.reefwatchvic.asn.au - info@greefwatchvic.asn.au						
PU Box 666, Melbourne, VIC 3001 - Ph. US 8541 /446 - www.redwalchinc.ssn.au - inloggreenwalchinc.ssn.au - Fish Count data							
Common name	1-5	4	#				
Dusky Morwong	1-0	023	257				
Red Morwong							
Banded Morwong							
Magpie Perch							
Bastard Trumpeter							
Herring Cale							
Horseshoe Leatherjacket							
Six-spined Leatherjacket							
Southern Blue Devil							
Ornate Cowfish							
Shaw's Cowfish							
Victorian Scalyfin							
Zebra Fish							
Old Wife							
Long-snouted Boarfish							
Sea Sweep							
Silver Sweep							
Blue Throat Wrasse							
Saddled Wrasse							
Senator Wrasse							
Maori Wrasse							
Western Blue Groper							
Eastern Blue Groper							
Harlequin Fish							
Weedy Sea Dragon							

3. Results

3.1 General summary

3.1.1 Participation and conditions

Sixty-five surveys were carried out by 30 groups at 38 different sites along Victoria's coastline (Fig. 1).

The depth of sites varied from 2–35 metres with visibility ranging from 2–20 metres. Water temperature varied from 15–21°C.

3.1.2 Survey methods

Scuba divers accounted for 65% of all surveys, with 34% undertaken by snorkellers. One survey was conducted by both scuba divers and snorkellers making up 1.5 (Fig. 4).

3.1.3 Protection status of survey sites

Most surveys (83%) were conducted in unprotected waters. The remaining 17% were undertaken within marine national parks or sanctuaries (Fig. 5).

3.1.4 Habitats surveyed

Most surveys were conducted at sites containing a number of different habitats and/or vegetation types.

Many sites were dominated by sand or mud (present at 63% of surveys) rocky reefs (present at 60% of surveys) and artificial reefs/habitats (present at 52% of surveys).

The presence of rubble was less common (present at 16% of surveys) (Fig. 6).

Mixed algae was the dominant vegetation type, recorded at over 81% of sites. This was followed by sponge gardens, seagrass meadows, and kelp forests (Fig. 7).

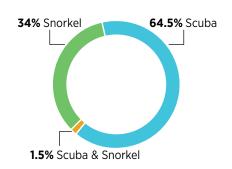


Fig. 4: Survey methods

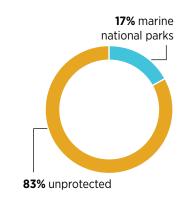


Fig. 5: Protection status of surveys

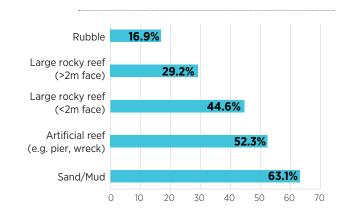


Fig.6: Habitat type fish count surveys conducted on (n=65)

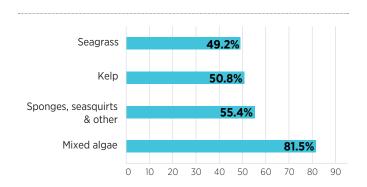


Fig. 7: Vegetation type fish count surveys conducted on (n=65)

3.2 The fish of 2022

3.2.1 Bony fish

The 'face' of the 2024 GVFC, the Herring Cale was seen in almost a third of all surveys (32%) mostly sighted in abundances of 1-5 individuals (Fig. 8).

Blue Throat Wrasse was observed in the highest proportion of surveys (90%), mostly occurring in abundances of more than 20 individuals (Fig. 8).

Magpie Perch, Zebra Fish and Victorian Scalyfin were observed in a high proportion of surveys (71%, 65% and 60% respectively).

Zebra Fish numbers were distributed across all abundance categories, whereas Magpie Perch were most frequently seen in groups of 6 to 20 individuals and Victorian Scalyfin were mostly recorded in sightings of between 1 to 20 individuals (Fig. 8).

Dusky Morwong, Senator Wrasse, Horseshoe Leatherjacket, Old Wife, Sea Sweep, Silver Sweep and Six-spined Leatherjacket were all observed in proportions over 40% (Fig. 8).

Less common bony fish species included Maori Wrasse, Ornate Cowfish, Red Morwong, Western Blue Groper and Bastard Trumpeter all of which appeared in a low proportion (<10%) of the surveys conducted (Fig. 9). Harlequin Fish were not sighted in any of the surveys this year.

3.2.2 Sharks and rays

The most sighted shark and ray species were the Smooth Stingray (40%), Southern Fiddler Ray (32%) and the Spotted Stingaree (26%) (Fig. 10).

Less common shark and ray species included the Black Stingray and Varied Carpetshark. Each appeared in low proportions (6% and 3% respectively) of surveys conducted.

Spotted Wobbegong, Elephantfish and Draughtboard Sharks were not sighted this year.

Most sharks or rays were recorded in abundances of 1-5 individuals (Fig. 10).

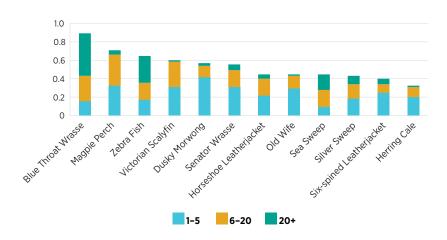


Fig.8: Most sighted bony fish

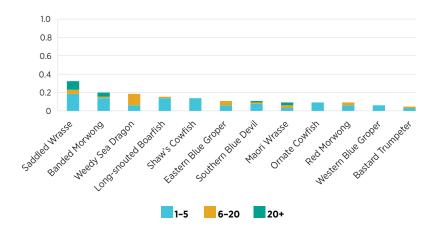


Fig.9: Less sighted bony fish

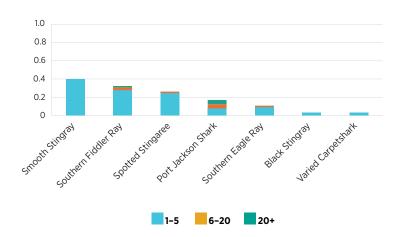


Fig.10: Most sighted sharks and rays

3.3 Comparison to previous years

3.3.1 Bony fish

The Blue Throat Wrasse was the most observed species of the survey (Fig. 8). The proportion of sightings of Blue Throat Wrasse this year is in line with what has been observed in previous years (Fig. 11a).

Zebra Fish, the second most sighted species, was spotted slightly more than the previous year, but in line with recent years (Fig. 11b).

Victorian Scalyfin continue to be sighted in over half of the surveys, with sightings up this year compared to 2023 (Fig. 11c).

Herring Cale numbers have remained steady over the past 10 years. There was a slight

uptick in sightings compared to last year (Fig. 11d).

Sightings of the Horseshoe Leatherjacket bounced back this year after decreasing sharply in 2023, whereas the Six-spined Leatherjacket sightings continued to decline (Fig. 11e & f).

3.3.2 Sharks and rays

Smooth Stingrays remain the most frequently sighted shark or ray species. While sightings declined slightly this year compared to last, they remain within the range observed in previous years. (Fig. 12a).

Spotted Stingaree sightings rose this year to their highest rate since the Fish Count began (0.28) after dipping last year (Fig 12b).

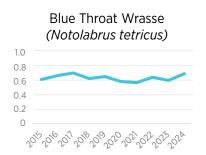


Fig. 11a

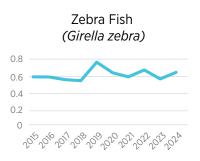
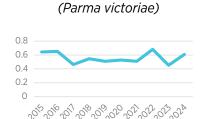


Fig. 11b



Victorian Scalyfin

Fig. 11c

Herring Cale (Olisthops cyanomelas)



Fig. 11d

Horseshoe Leatherjacket (Meuschenia hippocrepis)



Fig. 11e

Six-spined Leatherjacket (Meuschenia freycineti)

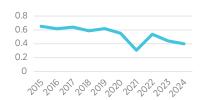


Fig. 11f

Smooth Stingray (Bathytoshia brevicaudata)

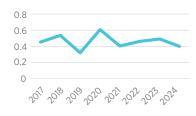


Fig. 12a

Spotted Stingaree (Urolophus gigas)



Fig. 12b



4. Discussion

4.1 General summary

4.1.1 Participation and conditions

Victoria's unique and dynamic coastline is reflected in the range of site conditions encountered by participants. Groups undertaking the GVFC on exposed rocky coasts were more likely to encounter unfavourable conditions than those in more sheltered locations, such as the many sites visited throughout Port Phillip Bay.

4.1.2 Survey technique

This year, the representation from snorkel groups participating was fantastic.

Scuba divers still represent the largest percentage of participants thanks to the continued support and enthusiasm of local dive stores and clubs.

4.1.3 Protection status

Established in 2002, Victoria's Marine Protected Areas (MPAs) are largely marine national parks and marine sanctuaries. MPAs cover an area of approximately 63,000 hectares – that's equivalent to 5.3% of the state's marine waters (VNPA, 2015).

They provide people with the opportunity to experience and observe marine life in environments that are undisturbed by fishing and other extractive activities.

Despite only covering a small percentage of Victoria's marine waters, they are embraced and used widely by the diving community. This is evident from the 17% of surveys that were carried out in MPAs in comparison to the small proportion of the coastline they occupy.

4.1.4 Habitats surveyed

Surveys were conducted at sites containing a number of different habitats and/or vegetation types. More surveys were conducted on rocky reef sites than on artificial structures, which may be a reflection of work being done by numerous organisations to raise the profile of the Great Southern Reef by encouraging more people to explore it.

The vegetation types at sites are a reflection of the habitats surveyed. It was encouraging to see golden kelp at more than 50% of the survey sites this year. The number of surveys done on rocky reefs has been slowly increasing, potentially as a result of the increased awareness of the importance of kelp habitats to marine life on the Great Southern Reef.

4.2 The fish of 2024

Herring Cale

Herring Cale (Olisthops cyanomelas) is a distinctive wrasse found only in the kelp-dominated rocky reefs of southern Australia, particularly within the Great Southern Reef (Australian Museum, 2025). It is closely associated with large brown macroalgae as well as seagrass beds, which provide both habitat and food (Shepherd & Baker, 2008; Bray, 2017b).

Their broad habitat use is supported by a flexible foraging ecology – Herring Cale primarily consume brown macroalgae but are known to adapt their diet based on seasonal availability (Shepherd & Baker, 2008). This dietary flexibility enables them to thrive in a range of coastal environments and contributes to the structuring and maintenance of algal communities on southern Australian reefs (Shepherd & Baker, 2008).

Herring Cale are easily recognised by their slender bodies, distinctive colouration and parrot-like beak. Juveniles display a grey to brown upper body that fades to a yellow belly, marked with darker brown patches and a broken silvery white stripe along their side (Australian Museum, 2025).

Females retain a camouflaged appearance into adulthood, developing a darker back adorned with bluish-white spots on each scale (Bray, 2017b). Their facial outline is cleverly disguised by narrow wavy blue and brown lines (Bray, 2017b; Kawase & Sunobe, 2023). Males, however, are the showstoppers: as juveniles, they are light and bright blue, and mature into almost black individuals with vivid blue highlights along the tail fin, pectoral fins, and snout (Kawase & Sunobe, 2023; Australian Museum, 2025).

During the breeding season, male Herring Cale become highly territorial, defending small patches within kelp forests. When a female enters his territory, he performs elaborate courtship displays, using his vibrant colours and energetic movements to attract her - similar to the displays seen in many bird species (Kawase & Sunobe, 2023). If successful, the pair ascend into the water column to spawn, releasing eggs and sperm into open water. This strategy aids in dispersing fertilised eggs away from predators and across wider areas (Kawase & Sunobe, 2023). The male's striking colouration plays a dual role in this process: it signals fitness to potential mates and acts as a deterrent to rival males.



Eco-Connect fish counters
Anita Dewhurst



Female Herring Cale Erik Schlögl/iNaturalist



Male Herring Cale Cara Hull



Blue Throat Wrasse Mark Stiebel/iNaturalist



Zebra Fish Kade Mills



Victorian Scalvfin Sascha Schulz/iNaturalist

Blue Throat Wrasse

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Blue Throat Wrasse (Notolabrus tetricus) are a dominant component of all shallow reef fish fauna from South Australia to New South Wales (Hutchins & Swainston, 1999).

They are sexually dimorphic, which means there are differences in appearance between males and females. This is most obvious in their different shape, colour and size (McCombe & Greer. 2013). Juveniles and females are greenish to brownish, with females gradually developing a broad dark band on the side behind their pectoral fin. Males, on the other hand, are brownish to blue-grey with a distinct white band on the side, and a pale bluish head with blue chin and yellow fins (Bray, 2020a).

Blue Throat Wrasse are born female and like many wrasse they can change from female to male during their life. This usually occurs when the dominant male leaves the harem. The most dominant female immediately changes sex to replace him. Intensive recreational fishing has been documented to reduce the number of large males in blue throat wrasse populations, as less fish reach the age or size requirement to change sex from female to male (Shepherd et al., 2010).

They are strongly site-associated (stay in the one place) and long-lived (up to 15 years). Adults usually inhabit rocky reefs and can be found in harems with ratios of one male to 10-20 females. Juveniles can be found in shallow weedy areas, with both of these habitats commonly occurring at GVFC sites, this likely explains their frequent sighting.

Zebra Fish

Zebra Fish (Danio rerio) are native to Australia and may often be seen around jetties, shallow rocky reefs and in weedy areas of the Victorian coast (Gomon et al., 1994). Often sighted in small schools, they have small heads with paleyellow fins and 9-10 black bars lining their bodies (Bray & Gomon, 2011)

Sightings during this year's GVFC were slightly

above previous years with the exception of a spike in sightings during 2019. This was likely due to a large number of juvenile Zebra Fish (pers obs) successfully surviving long enough to be being counted during that year's fish count. Successful survival of juveniles is dependent on a whole range of factors (temperature, food availability, water quality, predator abundance etc.). When favourable conditions occur, larger than usual numbers of juveniles survive, often settling in places/habitats that are unsuitable as they mature. When this occurs, they will be observed at a wide range of locations initially, then numbers will drop or even disappear from some locations because of unfavourable habitat.

This behaviour is common for fish that are group-synchronous spawners (i.e. fish that form schools then release large amounts of eggs and sperm into the water in the hope that fertilisation will occur) such as Zebra Fish.

Victorian Scalyfin

The Victorian Scalyfin (Parma victoriae) inhabits coastal rocky reefs, harbours, estuaries and

Juveniles are bright orange with neon-blue lines, spots, and a black eyespot, ringed with blue on their dorsal fin to intimidate predators. (Bray & Gommon 2011). Adults, on the other hand, may appear rust-coloured, with a head that varies from dusky yellow to dark grey, and sometimes even black. They have tell-tale pale spots along the lateral line of their body. They can grow up to 25cm in length (Bray, 2018b).

This small (up to 25 cm) fish punches well above its weight and is not afraid to chase much larger fish, seals, and even divers that stray into its territory. It will attack its own reflection in the mask of a diver to ensure that nothing is encroaching upon its space.

It is a damselfish, meaning it is closely related to that most famous of fish - Nemo (a clownfish). And just like its tropical cousin it is a colourful member of its home reef.

Both females and males begin life with a carnivorous diet and then become vegetarians as adults.

The territory they so aggressively defend is where they 'farm' the algae they eat. Victorian Scalyfin are the market gardeners of the sea - growing and harvesting seaweed on their rocky reefs, especially their prized crop of red algae. This is the superfood of seaweeds for Victorian Scalyfin, and it gives them the energy required to maintain their gardens, and for the males to prepare a bare vertical surface for the females to lay eggs on.

Once the females have laid the eggs in November to February, the males will guard them and aerate them until the larvae enter the water column, to begin the fight all over again.

Sightings of Victorian Scalyfin made a sharp increase in 2024 after a dip in 2023, being sighted in 58% of the surveys.

Smooth Stingray

The Smooth Stingray (Dasyatis brevicaudata) was again the most sighted of the shark and ray species in 2024. These sizeable stingrays can grow up to 4.3 metres and weigh up to 350kg. They are widespread in southern Australia (Bray 2018c) and reside in sandy habitats and shallow coastal bays.

Smooth Stingrays are ovoviviparous, meaning their young develop in eggs and remain inside the body of the adult until they're ready to hatch. Smooth Stingrays can give birth to 6-10 young, sized up to 36cm.

On their tail lies a venomous serrated spine. When threatened, the Smooth Stingray relies upon this effective defence mechanism to ward off intruders. Their large size and tendency to frequent piers throughout Victoria make them an easily identifiable species of ray, and may account for their high rate of observation.

Six-spined Leatherjacket and Horseshoe Leatherjacket

The three to four pairs of spines at the base of the tail are what gives the Six-spined Leatherjacket (Meuschenia freycineti) its name. The spines are more prominent on males than females or juveniles. They are sexually dimorphic (males and females look different) and the colour pattern can also varies between individuals. (Bray, 2017a).

The distinct black horse-shoe marking behind the pectoral fin of the Horseshoe Leatherjacket makes this one of the easier to identify Leatherjackets. Adults occur around rocky reefs while juveniles can often be found in shallow waters, often seeking shelter around artificial structures (Bray, 2020b).

The sharp decline in the proportion of Six-spined and Horseshoe Leatherjackets (Meuschenia hippocrepis) last year may have been due to a number of factors, including unfavourable environmental conditions for the settlement and subsequent growth of juveniles over the past couple of years which reduced abundance at popular fish count sites in shallower water and around artificial structures.

There may also be increased fishing pressure from both land and in-water fishers as leatherjackets are the fourth most commonly targeted fish by spearfishers after Flathead, Snapper and King George Whiting (VRFish, 2023). Lack of sightings may also be due to fish not being detected even though present.

It was encouraging to see the proportion of sightings rebound this year for Horseshoe Leather Jacket. The Six-spined Leatherjacket, however, has continued to decline in proportion. Although this rate has lessened, we will be continuing to monitor both species over the coming years.

Spotted Stingaree

Spotted Stingarees (Urolophus paucimaculatus) are easily identified by the complex pattern of white/cream spots on their dark coloured pectoral fin discs. They are not commonly sighted and considered solitary as shown in the data collected during the GVFC. The

proportion of sightings this year has sharply increased on previous years with a sharp rise in the numbers of Spotted Stingarees being spotted.

2024

4.3 Variability of sites

The detection of any species is dependent on more than just the species being present. The success of reporting species and abundance has been found to be linked to specific fish behavioural traits (Prais & Cabral, 2017). Individuals from the same population show different behavioural traits over time and across contexts (Bell et al., 2009). A widely accepted behavioural distinction is whether fish are shy or bold (Coleman et al., 1998). Bold fish were found to be more active, hide less and even learn simple conditioning tasks guicker than shy fish (Sneddon, 2003). In regards to fish counts, bold fish tend to be recounted and shy fish are likely to be missed (Pais & Cabral, 2017).

Other external factors like time of day, weather, visibility, depths of survey, tide or just pure luck can be of great influence. Occasionally we hear from discouraged Fish Counters who did not find any target species or species they expected to find during the Fish Count. We would like to encourage GVFC participants to stay motivated and curious even though you might not always encounter what you're expecting.



Common non-target species recorded in this year's surveys were Smooth Toadfish, Globefish, Blue Spotted Goatfish, Moonlighter, Longfin Pike, Mado and Snapper.

4.5 Reports of 'fish on the move'

VNPA has continued its partnership with Redmap Victoria in 2024. Once again, participants were encouraged to keep an eye out for any fish that seemed unusual in the

We look forward to our ongoing role as the watchers of the Bay, keeping an eve out for 'fish on the move' in Victoria. Any recordings taken during the GVFC survey period will contribute to Redmap's growing database - just don't forget to take a photo of your lucky find!



Spotted Stingaree Jasper Montana



Horseshoe Leatherjacket Willthelad/iNaturalist



Smooth Stingray danthediver/ iNaturalist

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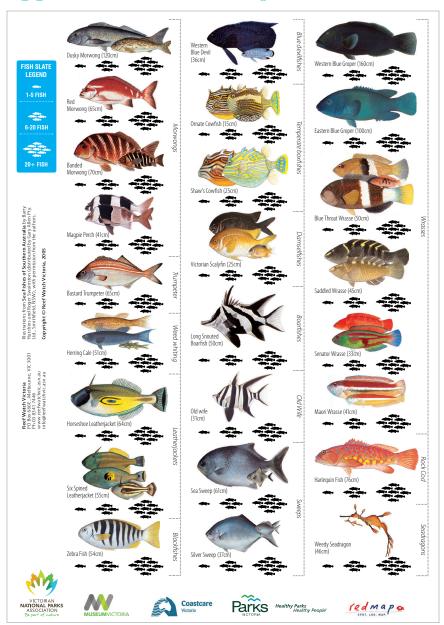
Acronyms and links

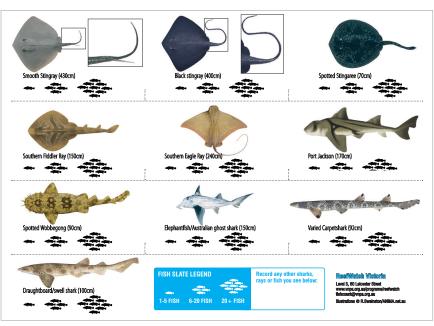
ALA Atlas of Living Australia (ala.org.au)

GVFC Great Victorian Fish Count (vnpa.org.au/great-victorian-fish-count)

VNPA Victorian National Parks Association (vnpa.org.au)

Appendix: GVFC identification slates







Male Herring Cale at Cape Woolami Kade Mills