

# FAQs – Swan and Canning Rivers *Alexandrium* species bloom and Paralytic Shellfish Poisoning

This fact sheet provides information, in a Frequently Asked Question (FAQ) format, relevant to Swan and Canning Rivers *Alexandrium* blooms, as well as general health, fishing and other issues relating to *Alexandrium* and Paralytic Shellfish Poisoning (PSP).

## What is the current health warning and the affected area?

The current health warning is to not eat fish, crabs or shellfish collected from the following areas within the Swan and Canning Rivers:

- **Swan River** – from Pelican Point, Crawley to the South of Perth Yacht Club, Applecross and upstream to Middle Swan (Reid Highway) Bridge, Middle Swan (this includes the commonly known areas of Como Jetty, Matilda Bay, Perth Waters, Elizabeth Quay, Barrack Street Jetty, Claisebrook Cove, Maylands Yacht Club, Ascot Waters, Hind Reserve, Riverside Gardens, Garvey Park, Sandy Beach Reserve, Point Reserve, Kings Meadow, Fish Market Reserve and Woodbridge Riverside Park).
- **Canning River** – from the South of Perth Yacht Club and upstream to Kent Street Weir (this includes commonly known areas of Canning Bridge, Mt Henry Bridge, Salter Point, Shelley Bridge, Riverton Bridge, and Castledare).

A **MAP** of the **current health warning area** and the latest *Alexandrium* species levels can be viewed on the Department of Biodiversity, Conservation and Attractions (DBCA) website:

[www.dbca.wa.gov.au/science/riverpark-monitoring](http://www.dbca.wa.gov.au/science/riverpark-monitoring)

For the **latest** Department of Health **media statement** refer to: [health.wa.gov.au/News](http://health.wa.gov.au/News)

**Note:** Shellfish includes oysters, mussels, clams, pipis, scallops, cockles and razor clams.

## Background

In early 2019, the Swan River experienced a toxic algal bloom caused by the microscopic species *Alexandrium minutum* that lasted for several months. During this time, the Department of Health issued repeated warnings about the risk of paralytic shellfish poisoning (PSP) and advised not to consume fish, crabs or shellfish from the impacted area.

In December 2019, an *Alexandrium* bloom again began to form in the middle Swan River and health warnings were again issued. Between mid-January and mid-February 2020, the bloom peaked in both the Swan and Canning rivers. Visible yellow algal plumes were observed between Perth Waters (East Perth), Matilda Bay (Crawley) and the South of Perth Yacht Club (Applecross).

Toxin testing of mussels, crabs and fish have confirmed elevated levels of paralytic shellfish poisons (PSPs) (Saxitoxin equivalents), in both mussels and crab - viscera (internal organs) above the Australian and New Zealand Food Standards Code (ANZFS) maximum level for bivalve molluscs.

## What does the algal bloom look like?

At very high densities the algae can appear as a dirty red or rusty, orange or yellow discoloration of the water. Toxic loads can build up in shellfish before *Alexandrium* densities reach these levels and there may be no visual indication of the presence of algae.

## What are the potential health risks caused by the toxins produced by *Alexandrium*?

*Alexandrium* produce toxins that can be concentrated by filter feeding shellfish. Consumption of shellfish containing high levels of these toxins can result in PSP. In the worst-case scenario, this can cause muscular paralysis and death due to respiratory failure.

Crabs may bioaccumulate these paralytic shellfish toxins (PSTs) in the viscera (internal organs). PSTs may also bioaccumulate in the muscle tissue of both crabs and some fish, but generally (based upon testing undertaken to date) at very low levels.

Cooking, pressure cooking and/or freezing processes do not destroy these PSTs.

## What is Paralytic Shellfish Poisoning (PSP)?

Paralytic shellfish poisoning (PSP) is caused by eating shellfish and potentially some other types of seafood containing paralytic shellfish toxins (PSTs). PSTs are produced by some types of naturally occurring algae e.g. *Alexandrium*, which are accumulated by filter-feeding shellfish. Crabs and certain fish also feed on shellfish, which may lead to bioaccumulation of PSTs in their organs and muscle tissue and could be dangerous if consumed.

## What are the symptoms of PSP?

Symptoms of PSP are known to begin within minutes or up to 24 hours after eating shellfish and possibly crabs and fish.

Initial symptoms include tingling and numbness around the mouth which can spread to the face, neck, arms and legs.

Other symptoms include:

- nausea and vomiting
- headache
- weakness
- blurred vision or temporary blindness
- prickly sensation at the finger tips
- change in temperature sensation
- loss of balance
- difficulty speaking or swallowing
- in severe cases difficulty breathing, paralysis and death can occur.

## What should I do if I feel sick, or experience PSP type symptoms?

Seek urgent medical attention, particularly if you or someone you know experiences PSP symptoms or has any difficulty breathing. In severe cases people are monitored in hospital and may need breathing support.

## Is there an antidote for PSP?

No. There is no specific antidote for PSP.

## How long do PSP symptoms remain?

Evidence suggests that after 12-24 hours, regardless of severity, victims start to recover gradually and are without any residual symptoms within a few days.

## What is the level of risk associated with eating shellfish, crabs and fish collected within the affected area?

The level of risk associated with eating shellfish, crabs and fish from the affected areas in the Swan and Canning rivers can vary. Toxin testing has confirmed that the level of PSTs detected in mussels is generally higher than that detected in crabs.

Increasing *Alexandrium* levels through mid-January to mid-February 2020, resulted in some mussel and crab (viscera) samples with PST levels that exceeded the ANZFSC maximum level for bivalve molluscs.

## Can I safely consume shellfish, crabs and fish taken outside of the affected area?

It is very unlikely that consuming crabs and fish caught outside of the affected area poses a significant risk of exposure to harmful levels of PSTs. However, as a precaution, it is recommended not to consume the viscera (internal organs) of the crab, removing them from the crab prior to cooking. Should you feel unwell or experience symptoms of PSP; you should seek urgent medical attention.

DoH advice is that caution should be exercised whenever recreationally collected shellfish are taken from rivers or estuaries to be eaten. Farmed shellfish purchased in supermarkets and other commercial outlets in WA are safe as there is a strict quality-assurance program to ensure they are safe for human consumption.

## Has anyone suffered PSP from eating affected crabs or shellfish?

*Alexandrium* blooms are a relatively recently known occurrence in Western Australia and to date the DoH is not aware of any illness or death due to PSP. However, PSP illness in Tasmania and New Zealand, has resulted in people being hospitalised after eating shellfish/seafood from waterways affected by *Alexandrium* blooms.

Note: PSP is not a listed notifiable illness/disease and doctors are not obliged to report suspected/confirmed PSP cases.

## Is it safe for me to swim in and recreate on the Swan or Canning Rivers?

Yes. Swimming, water-skiing and boating is safe, but as a general rule swimming should be avoided in areas of discoloured water or for two to three days after heavy rainfall events in riverine systems.

There may be some areas associated with this bloom, where a yellow to red discoloration or plume of the water may be observed. These areas should be avoided by people and their pets.

## Can the *Alexandrium* algae cause skin irritations?

Not that we know of, but it is recommended to avoid swimming in discoloured water in the affected area or where surface scums are evident.

## What is being done to alert people fishing in the affected area who might be unaware of the situation?

The DoH has issued media statements, as the *Alexandrium* bloom has expanded, to advise of the affected area, potential health risks/concerns and other key information.

The media statement provides links to these FAQs, and a link to the [DBCA website](#) with a map of the warning area and other weekly algal/water quality monitoring information.

The Department of Primary Industries and Regional Development (DPIRD) is also publishing the latest available information via its website: <http://www.fish.wa.gov.au> and social media platforms.

DoH has been working with river-front local government authorities to ensure health warning signs are installed at popular foreshore areas, jetties and boat ramps (see health warning sign below).



DoH has also prepared a [flyer](#) with key *Alexandrium* bloom and PSP information that can be given to fishers and crabbers on the river by DBCA and DPIRD Riverpark/officers.

## Where are health warning signs displayed?

Health warning signs that state: 'Do not fish, or do not collect crabs or shellfish', have been erected, or put in place at popular fishing spots, jetties, boat ramps etc. within the impacted area. Even if a sign is not erected at the place you fish, within the impacted area, you are still advised not eat any fish, crabs or shellfish caught or collected in that location.

## Where can I fish in the Swan and Canning Rivers?

It is recommended that any fishing or crabbing for consumption is undertaken outside of the current warning area. However, it is still okay to fish (**catch and release only**) within the warning area. Please check the Department of Health website: ([health.wa.gov.au](http://health.wa.gov.au)) for current health warnings before you go fishing in the Swan or Canning Rivers.

## How long will the *Alexandrium* bloom and associated health warning last?

It is not known how long the *Alexandrium* bloom will last, but a previous bloom persisted for several months. It is likely to remain until environmental conditions change significantly.

DBCA will continue to monitor algae levels within the Swan and Canning rivers and provide advice to DoH. DoH will update current health warning (as appropriate) and advise when river conditions are satisfactory from a public health perspective.

## How do shellfish become contaminated?

Shellfish feed by filtering small food particles; including microscopic algae, out of the water. When shellfish filter microalgae (e.g. *Alexandrium*) that produce PSTs, they accumulate these toxins in their tissues. Shellfish are relatively resistant to the PSTs but can transfer them on to other animals and humans that consume the shellfish.

## How long after a bloom do PSP toxins remain in shellfish, crabs and fish?

Even after a bloom ends, PSTs in crabs and some types of shellfish can remain for some time. PSTs in some mussel species may reduce quickly i.e. within days to a couple of weeks, whilst crabs and some fish and other shellfish species may take up to a month or even longer. DBCA testing found residual toxins in pygmy mussels 4 months after an *Alexandrium* bloom.

## What is the maximum level of PSP in bivalve molluscs (shellfish)?

The ANZFSC stipulates a maximum level of paralytic shellfish poisons (PSPs) (Saxitoxin equivalent) in bivalve molluscs (e.g. shellfish) of 0.8 mg/kg.

## Is the ANZFSC maximum level for PSP in bivalve molluscs (shellfish) also applicable to other seafood?

Whilst the ANZFSC only stipulates a maximum level (ML) for PSPs in bivalve molluscs, there is a general requirement that all food sold be safe for human consumption.

Recent algal blooms in Tasmania have resulted in this same ML being applied to other seafood types, including rock lobster and abalone, for both domestic and export trade. This ML is applied internationally for bivalve molluscs, and by some countries to some other seafood commodities.

## Does adherence to ANZFSC maximum levels (ML) from toxin testing in shellfish, crabs and fish guarantee their safety?

Whilst, adherence to ANZFSC PSP ML in shellfish, crabs and fish, provides a reasonable level of confidence that crabs, fish and shellfish taken recreationally, are most likely safe for consumption; results within an expansive river system should be considered indicative and treated with caution.

However, there are several factors that influence seafood safety in large urban catchments. Examples include: crab and fish water movements, changing environmental conditions, including: bloom movement and persistence, local pollution sources, stormwater runoff etc.

In addition, the cost of toxin testing and the additional associated resourcing requirements, limits the number of tests reasonably able to be performed.

## Should I consume shellfish that are collected recreationally?

Regardless of the presence or absence of *Alexandrium* and/or PST's, people should avoid eating wild shellfish collected recreationally as their safety cannot be guaranteed. This is particularly the case in rivers, estuaries or other waterways, like the Swan and Canning Rivers, where there is an increased likelihood of contaminant or nutrient inputs, which may result in elevated levels of algal toxins, bacteria, viruses, heavy metals and/or other contaminants within shellfish.

It is especially unsafe to eat wild shellfish from:

- marinas or other areas potentially subject to boat discharges
- areas near outfalls from sewage, septic tanks, stormwater or industrial sites
- areas affected by recent heavy rainfall
- areas affected by toxic algal blooms.

## What shellfish are safe for human consumption?

The DoH recommends only eating shellfish that has been harvested commercially under strict monitoring programs, that ensure waters are free from pollutants and toxins. These safety programs include routine testing of the animal as well as the waters to make sure the shellfish are safe to eat. Farmed shellfish purchased in supermarkets and other commercial outlets in WA are subject to a strict quality-assurance program to ensure they are safe for human consumption.

## What testing of Swan River crabs available in the shops is occurring to ensure they are not affected by *Alexandrium*?

The advice received is that all crabs collected by the commercial operator are from areas of the river not subject to current health warnings. However, DoH is working with relevant local government food enforcement agencies, to obtain additional information about measures in place to ensure the safety of commercially harvested crabs from the Swan and Canning rivers.

## Have *Alexandrium* blooms occurred in the Swan River previously?

*Alexandrium* has been recorded in the Swan River since 2001, but 2019 was the first year when a widespread *Alexandrium* bloom occurred in the river system. *Alexandrium* blooms are a global issue, having impacted waterways and fisheries in Europe, Asia, North America and Oceania.

## What factors contribute to *Alexandrium* blooms?

Waterways contain many different species of algae that will opportunistically take advantage of ambient conditions to proliferate and out-compete co-occurring species. Factors influencing the proliferation and continuation of *Alexandrium* blooms include *temperature, turbulence, salinity, available nutrients, water clarity and relatively calm weather conditions.*

## How does the *Alexandrium* bloom spread within the river?

The *Alexandrium* bloom spreads up and down the river through the movement of winds and tides, pushing the alga back and forth and up and down the river.

## What is the likely impact of the *Alexandrium* bloom on the river's ecosystem and wildlife?

*Alexandrium* produces potent neurotoxins which are toxic to some zooplankton and small fish. This in turn may alter the dynamics of the river ecosystem. *Alexandrium* also has the potential to impact wildlife as toxins can accumulate up the food chain. Filter feeders such as mussels filter water and can remove the algae from the water column. The algae contain toxins which can accumulate in mussels, which mussels can then be consumed by other organisms including crabs and fish. To date no negative effects on wildlife has been observed from these blooms.

## What factors lead to a decline of an algal bloom?

Algal blooms generally cease when available nutrients in the water are depleted and/or the environmental conditions, such as light and temperature, no longer support algal growth.

## Are there any control measures to stop/reduce the spread of the bloom?

Although, there does not appear to be anything that can be done to stop the spread of this alga, DBCA continues to consider potential control options. In the past, DBCA has investigated different approaches to control algal blooms.

Each type of algae is unique, and DBCA will consider its previous laboratory research and other potential approaches to providing ongoing management for *Alexandrium*.

## What can Perth residents do to help slow down the algae's spread and prevent future outbreaks?

Reduce your fertiliser use and only fertilise at the right time of year. Having a waterwise garden, that doesn't use a lot of fertiliser, or water, helps to reduce nutrient losses to the environment and saves people money. DBCA supports the 'RiverWise gardening' workshops that are held by Josh Byrne.

These workshops provide a great forum for people to; better understand how they can make positive changes to their practices that can help their gardens and the Rivers. Refer to the River Guardians website for more information: <https://www.riverguardians.com/>.

People can also pick up after their dogs, rake up lawn clippings/ leaves and put them in the bin to reduce the nutrient load being washed into our drains which ultimately flow into our rivers.

## What other river management initiatives help prevent *Alexandrium* and other algae from spreading?

Algae are a natural part of the river system, and algal blooms are quite common in nutrient rich river systems. Controlling nutrients that enter the river system helps to reduce the likelihood of nuisance and toxic algal blooms.

DBCA and its' partners use constructed wetlands, foreshore plantings, and different landcare initiatives, to help reduce nutrients such as nitrogen and phosphorus from entering our rivers. Fewer nutrients in the water means less nutrients for algae and fewer blooms.

Additionally, DBCA also run free behaviour change programs such as: 'RiverWise gardening' workshops, to assist residents and land managers to use fertiliser more responsibly.

DBCA in partnership with DWER also provide artificial oxygenation to around 14 kilometres of the upper Swan and Canning Rivers through four oxygenation plants. This oxygenation zone provides a refuge area for aquatic wildlife at times of the year when there is low oxygen in these parts of the river which also helps to reduce nutrient release from the sediment and with processing of nutrients that enter the river system.

DBCA endeavours to remove any dead fish from the river when fish kills occur, as they can produce and contribute harmful bacteria into our rivers.

## How is the *Alexandrium* bloom response being managed?

DBCA, in conjunction with DPIRD and DoH, meet regularly during *Alexandrium* bloom events to discuss the latest results, ongoing monitoring activities, communication and other response measures, which includes determining where/when to undertake toxin testing of mussels, crabs and other fish species, and to issue relevant stakeholder updates and health warnings.

## Monitoring Information (Swan and Canning Rivers) web-link

DBCA is the Western Australian state government agency which undertakes management, and weekly phytoplankton (microalgae) and physico-chemical water quality monitoring throughout the Swan and Canning Rivers. For current monitoring information refer to DBCA website:

<https://www.dbca.wa.gov.au/science/riverpark-monitoring>

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