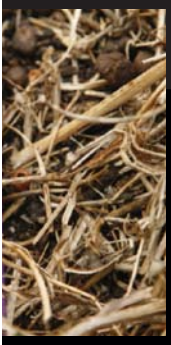
GARDEN GUIDE

A simple garden guide for Geographe Bay
Eagle Bay to Dalyellup








GeoCatch
The Environment - in Our Hands

www.geocatch.asn.au

The Geographe Catchment is home to the internationally recognised Vasse Wonnerup Wetlands and the majestic Geographe Bay.

Geographe Bay is in relatively good condition and is home to hundreds of different life forms, including the second largest temperate seagrass meadow in Australia. However, water quality monitoring in the Geographe Catchment indicates that the health of the Bay could be at risk if nutrient inputs continue to increase. High nutrient loads send our natural aquatic systems out of balance, fuelling algae growth which can smother plants and lead to the death of fish and other aquatic fauna. These nutrients come from a range of sources, both urban and rural, and everyone can do their bit to reduce them.

"A healthy bay begins... in your own backyard"

This GeoCatch Bay OK Garden guide promotes sustainable gardening principles to create beautiful, healthy gardens that have a positive impact on the environment. A Bay OK Garden minimises nutrient leaching, supports local biodiversity and provides a refuge for native animals. By following the Bay OK Garden principles detailed in this guide, you can help to protect our rivers, wetlands and the Geographe Bay marine environment.

The three Bay OK Garden Principles are:

1. Minimise Nutrient Runoff

This section looks at the best environmental approach to improving your soil and managing your nutrient outputs.

2. Conserve Water

This section looks at practical and simple initiatives to improve water efficiency in your garden to avoid overwatering and leaching of nutrients into waterways.

3. Support Local Biodiversity

This section highlights simple features and approaches that can be incorporated into your garden to help support local biodiversity.

A Bay OK Garden Design

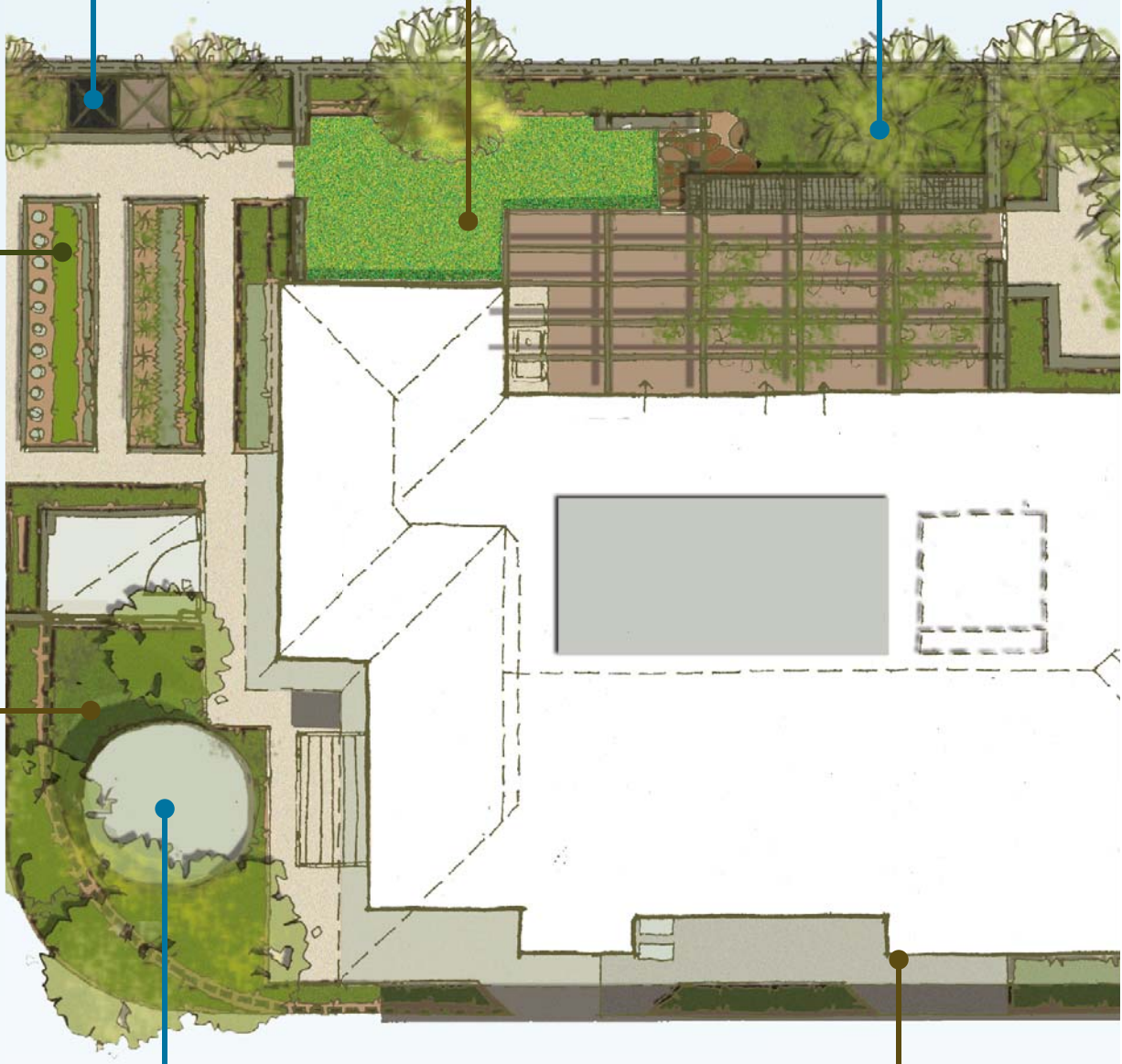
key features & approaches

Maximise water efficiency in garden beds with the use of stream rotors on fixed rigid riser sprinklers, or use drip line irrigation. For information on irrigation see pages 10-12.

Install a compost bin and/or worm farm to turn your kitchen and garden waste into valuable organic compost for the garden. Refer to page 9 for further information.

Minimise lawn areas as they have high fertiliser and water needs. For information on hydrozoning see page 7.

Adopt crop rotation practices within your productive garden beds to control pests and diseases. Refer to page 13 for further information.



If you apply fertiliser make sure you refer to the manufacturer's application rates to avoid excess leaching into waterways. Refer to page 9.

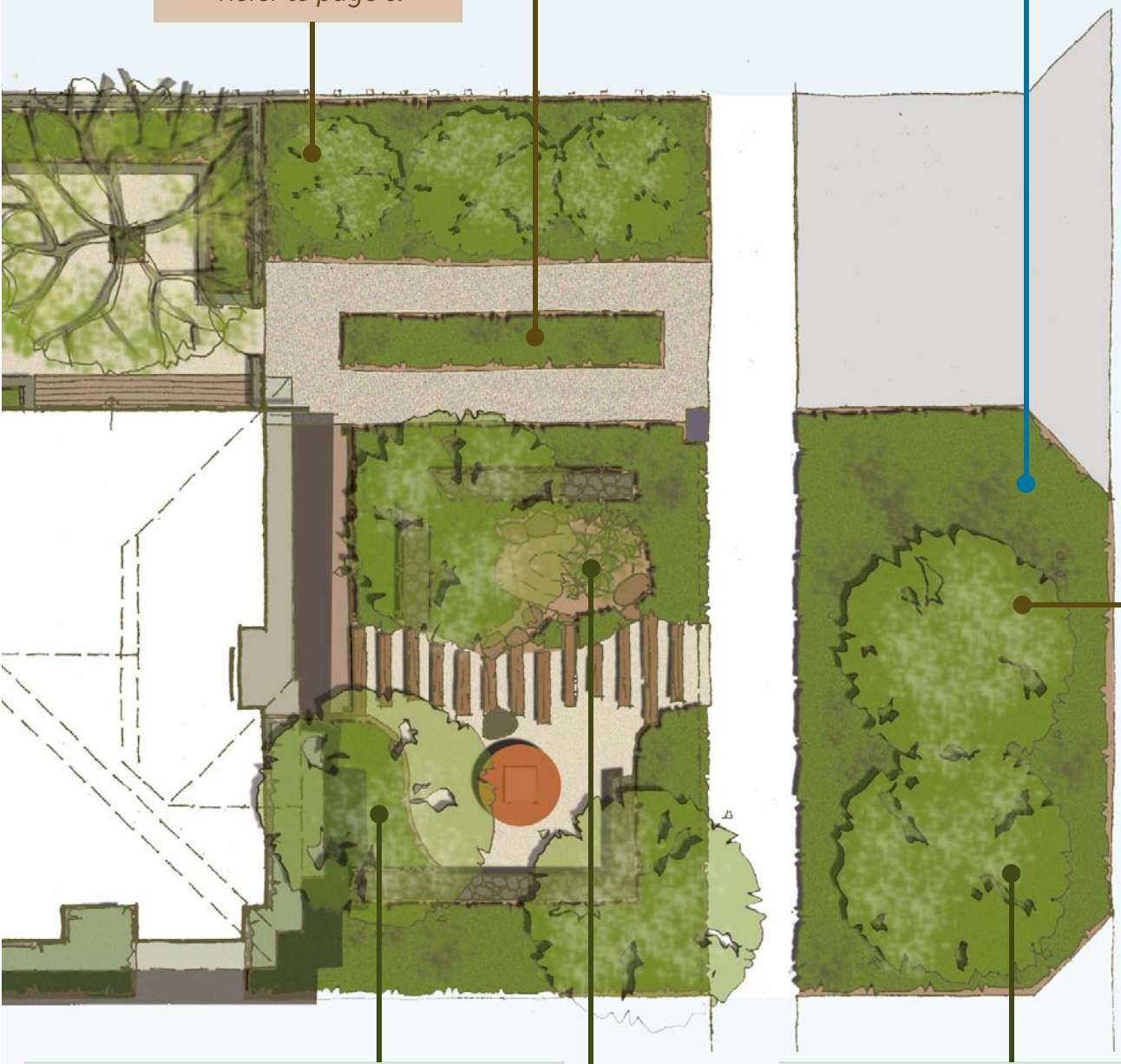
Conserve water by installing a rainwater tank which can be used to help irrigate your garden and be plumbed to your toilet and washing machine to save even more water.

Install simple irrigation technologies such as a rain sensor or soil moisture sensor. These can adjust your irrigation watering run times during/ following rain events. See page 10 for further information.

Minimise hard surfacing with clever use of low growing natives in non trafficable areas of the driveway. Refer to page 7.

Native verge gardens are a great water efficient alternative to lawn. If you install these gardens in winter, you don't need to install permanent irrigation as hand-watering should be sufficient during hot periods.

Maintain a 5-10cm layer of mulch in garden beds. Refer to page 6.



Obtain a soil test to determine what nutrients, if any, are deficient in your soil. Refer to page 5 for more information.

Native trees provide essential habitat for local fauna. Mature, established trees are perfect for incorporating bird, possum and bat nesting boxes. Refer to page 13 for further information.

Native verge gardens planted with local endemic shrubs and trees support local biodiversity and require minimal fertiliser and water. Refer to page 13.

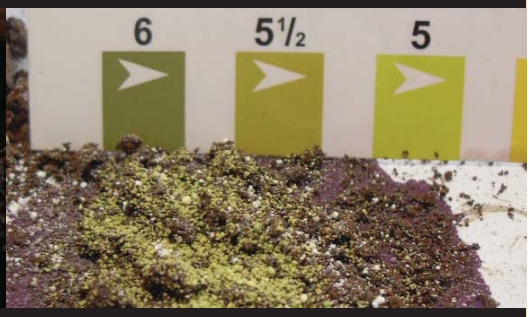
Frog ponds are great garden features that can encourage and support local fauna and help to control pests and diseases. Refer to page 13.

Know your Soil and Obtain a Soil Test

Obtaining a comprehensive soil test is a thorough way to accurately assess which, if any, nutrients are deficient in your soil. Soil laboratories can undertake these tests and provide a clear, simple written report of recommended nutrient adjustments. Ideally, this test should be conducted annually. Ecogrowth (www.ecogrowth.com.au) is a Perth based company who can provide these soil tests.

Nutrient deficiencies are often the result of pH problems (either too acidic or too alkaline) rather than insufficient fertiliser. The ideal pH for most garden plants is around 6.5-7. You can easily test the pH of your soil by purchasing a powder or liquid self test kit or using an electronic pH meter. If you do need to amend the pH of your soil either by adding lime to raise pH, or sulphur based compounds to lower it, just remember that it is a slow process. In all cases applying organic matter to the soil assists in bringing both acidic and alkaline soils back towards neutral whilst also improving the texture and vitality of the soil.

pH self test kits



Improve your Soil and Use Soil Conditioners

Geographe Bay soils are predominately sandy soils with low nutrient content so will benefit from soil conditioners to help increase their microbial activity and fertility as well as the soil's moisture and nutrient retention capacity. There is a variety of soil conditioners available including:

- **Compost** is easily produced in your own backyard using food and garden waste products
- **Clay (bentonite)** increases the water and nutrient holding capacity of sandy soils
- **Soil Wetting Agents** act like a detergent to break down the waxy coating on hydrophobic soil particles to allow water to penetrate the soil profile
- **Mineral Soil Amendments (spongolite, zeolite)** are an alternative to clay and are naturally occurring materials that have the ability to hold nutrients and prevent leaching
- **Water Storing Granules** are manufactured polymers which swell up as they absorb large quantities of water

spongolite

water storing granules

bentonite clay

Apply the Right Amount of Soil Conditioner

The recommended application rates are provided below for different garden areas:

- **New garden beds (inc. productive beds) -** compost, clays and mineral soil amendments should be applied as per the manufacturer's application rate which is typically a single application mixed thoroughly into the top 25cm of existing soil. Soil wetting agents should be evenly spread on the soil's surface.
- **Existing garden beds** -whether soil conditioner/amendments are required will depend upon the soil's existing condition. If the soil is poor and plants look hungry, apply soil conditioners as per the recommended application rates and method on the product label.
- **Existing productive garden beds** - reapply compost each time you replant and apply a soil wetting agent if the soil becomes hydrophobic.
- **New lawns** - soil conditioners should be mixed into the top 25cm of existing soil to create the lawn's sub base. This is then lightly compacted and leveled for roll-on or lawn seed to be applied.


water storing granules


compost


zeolite

Mulch

Mulch dramatically improves moisture retention by reducing evaporation from the surface of the soil. It also feeds plants essential nutrients as it breaks down, helps to suppress weeds and insulates plant roots from extreme temperature fluctuations.

It is important to maintain an even 5-10cm deep layer of organic, course mulch across all your garden beds.

Ensure a face mask is worn during the application of any soil amendment to prevent inhalation of material or associated micro-organisms.

When sourcing organic soil conditioners and mulches, check that they are sourced from an accredited composting facility or if bagged, they should have these labels on the bag. Mulches should be weed and pathogen free.

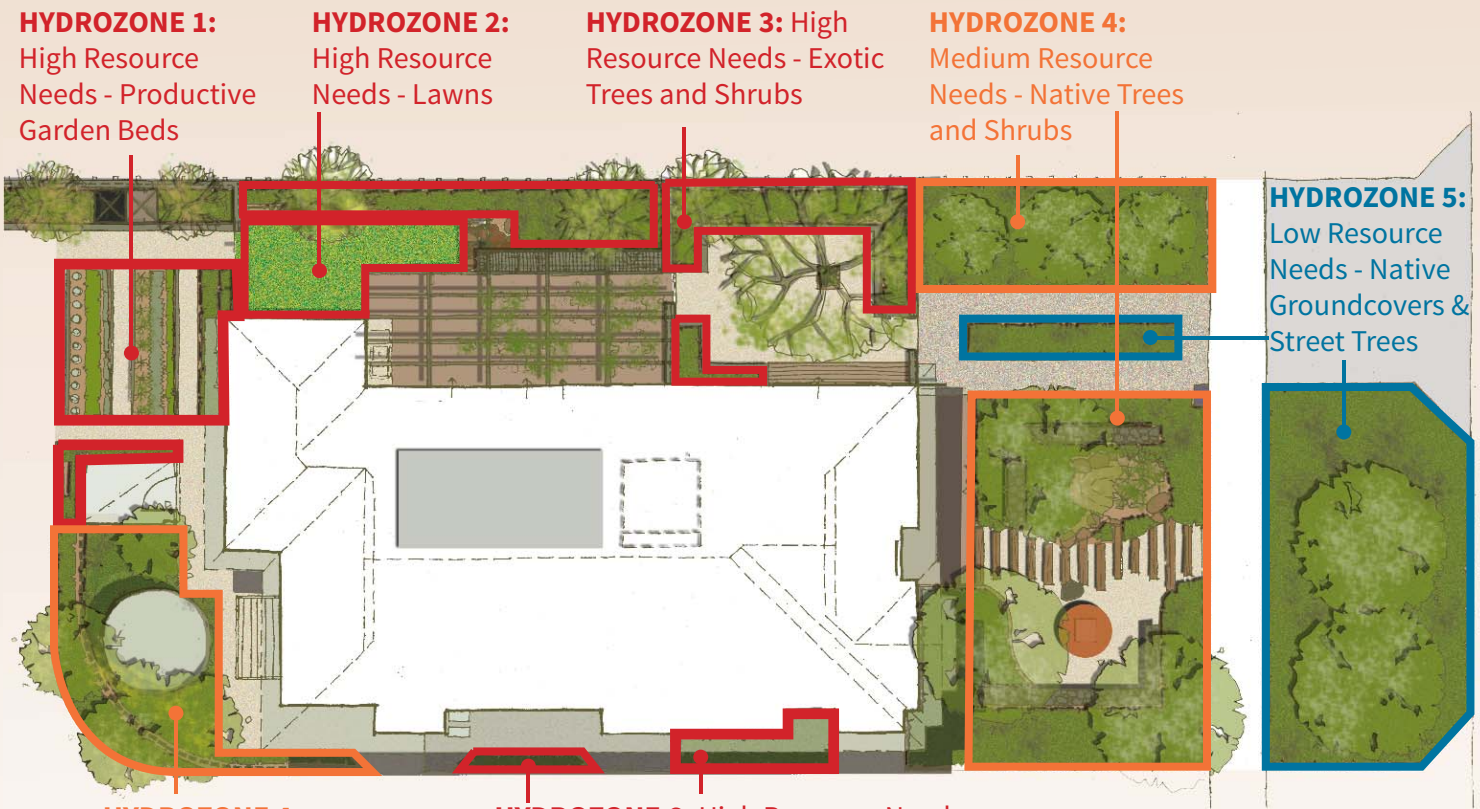
Smart Approved WaterMark

Waterwise APPROVED

Use Hydrozoning Principles

Hydrozoning involves classifying garden areas based on the garden's fertiliser, water and maintenance needs. To ascertain which areas require more resources depends on its visual importance or amount of use. Below are some simple hydrozoning principles to consider:

- **Minimise plants with high water and fertiliser needs** - Generally lawns require more water, fertiliser and maintenance than a shrub bed; similarly with exotic shrubs compared to native shrubs and succulents.
- **Group similar plants in each hydrozone** - Plants should be grouped according to their fertiliser, water and sunlight requirements. For example: lawn and shrubs should be on separate hydrozones.
- **Irrigate based on hydrozones** - Use the identified hydrozones to assist with your irrigation layout. For example, it is recommended that sprinklers are used across all lawn areas and drip irrigation for garden beds.
- **Use consistent sprinkler heads on each hydrozone** - This ensures even water distribution and pressure to maximise water efficiency.
- **Minimise the amount of hard surfaces** - This helps to minimise the amount of stormwater runoff, increases the natural infiltration into the groundwater, increases local biodiversity and micro-organism activity in the soil and reduces the effect of heat absorption.



an example of a hydrozone plan

Refer to page 12 for recommended watering times for each hydrozone

Minimise Nutrient Runoff

Select the Right Fertiliser

If fertiliser is required consider a controlled release or organic fertiliser:
Controlled release fertilisers, also known as slow release fertilisers, are coated compressed pellets and release nutrients over a longer period of time because they are not water soluble. They are suitable for lawn as well as garden areas as they reduce the incidence of fertiliser burn.

Organic fertilisers are derived from plant and animal parts/residue and are recommended for both garden or lawn application (depending on product selection) as they:

- Improve soil structure and its water retention ability
- Introduce micro-organisms into the soil which helps with nutrient uptake in the plant

Some organic fertilisers types include; blood and bone, bagged manures, and rock mineral based fertilisers.


various fertilisers available

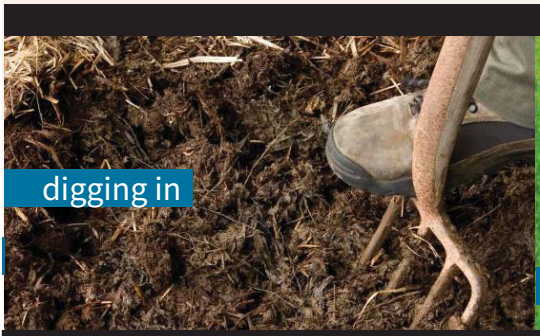

rock mineral fertilisers


controlled release fertilisers

Apply Fertiliser Correctly

There are four main application methods for distributing fertiliser:

- **Deep soil application or 'digging'** is the best method of mixing organic fertilisers into the soil prior to planting.
- **Hand broadcasting or using a manual broadcast spreader**, if applied correctly, can provide an even distribution of the fertiliser to the required area.
- **Liquid application** is an effective method of applying fertiliser as plants can uptake nutrients quickly. It is important to ensure you don't over apply, as liquid fertilisers can easily leach into groundwater and adjacent water courses. Also, if you use a solution that's too 'strong' you may burn or scorch the leaves. Frequent light applications are better than heavy, infrequent applications.


digging in


manual broadcast spreader


liquid applications

Minimise Nutrient Runoff

responsible fertiliser use

Use the Right Amount of Fertiliser

With so many products available on the market it is important to follow each product's recommended application rates to minimise the risk of over fertilising. Home made fertilisers should also be used carefully. Consider the following as a guide:

- **Worm residue** - Steep a cup of worm castings in a bucket of water for a day then drain off the liquid to use as a liquid tonic to plants
- **Worm casting** - Incorporate a handful into the planting holes of young plants or seedlings
- **Aged animal manure** - can be distributed on top of garden beds or dug through the soil. Dependant on the type of manure, up to 10L or one bucketful per m^2 should suffice for hungry plants like veggies and fruit trees.

Whilst organic fertilisers provide significant benefits, (as mentioned on page 8) it is important to remember that over fertilising of these products, as well as other fertiliser types, can leach into the waterways and lead to algal blooms and fish kills. If the plant looks healthy and happy then you probably don't need to fertilise.

It is important to read the products recommended location and where they best apply (i.e. for citrus or lawn areas) to ensure they are suitable.


aged animal manure


worm farm


chemical fertiliser

When to Fertilise

- **Lawn Areas** - If fertiliser is required, apply in spring and early autumn. Avoid fertilising in winter as lawns become almost dormant and there is a high risk of fertiliser washing into stormwater drains or leaching into groundwater
- **Ornamental Exotic Garden Beds** - Apply fertiliser bi-annually in spring and autumn
- **Productive Garden Beds** - Apply fertiliser quarterly when replanting
- **Native Garden Beds** - Apply fertiliser annually in spring for new plantings. Established plants don't need it often

Avoid fertilising when heavy rain is forecast

Look out for this logo on fertiliser products. Refer to www.fertilisewise.com.au for more information on responsible fertiliser products & practices

Fertilise WISE

Install an Automatic Irrigation System

Automatic irrigation controllers are programmable electronic timers which switch irrigation stations on and off at specified times. They are highly recommended because they:

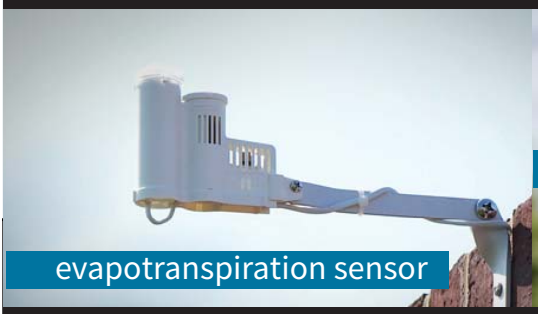
- Are convenient and save time
- Can be easily adjusted (or automatically self adjusted) to suit the climatic conditions/ seasons
- Reduce the likelihood of over or underwatering when managed properly

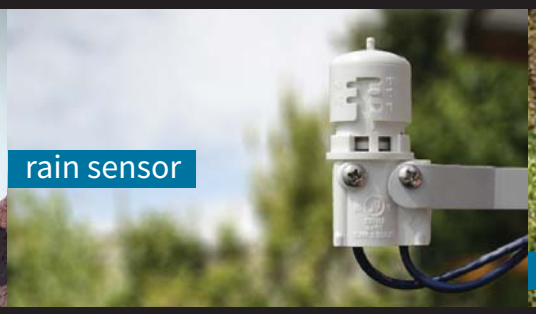
automatic irrigation controller

Consider Installing Water Saving Technologies

These can be inexpensive devices that are easily fitted to most automatic irrigation systems, and can save water by irrigating based on the weather readings.

- **Evapotranspiration sensors** and weather stations are sensors that will adjust the irrigation cycle based on a mixture of the current climatic conditions and the plant's estimated water demand
- **Rain sensors** disconnect the automatic irrigation system controller temporarily when a specific amount of rainfall has occurred
- **Soil moisture sensors** modify the pre-set irrigation run time based on the amount of moisture in the soil, i.e. if it has rained recently and the soil is moist, it will either reduce the run time or may even stop the program temporarily


evapotranspiration sensor


rain sensor


soil moisture sensor

For all your irrigation needs consult with a waterwise irrigation specialist. A list can be found on the Irrigation Australia website **www.irrigation.org.au**

Waterwise APPROVED

Select the Best Irrigation Type

The various sprinkler types and their recommended application are detailed below:

Fixed Spray Sprinklers

Recommended Application: Lawn ✔ Garden Beds ✕

Fixed spray sprinklers have fixed radius heads set at a pre-set arc or a predetermined radius action. Position them so that they aren't blocked by vegetation and don't overspray onto paving.

Rotary Sprinkler

Recommended Application: Lawn ✔ Garden Beds ✔

Rotary sprinklers provide even water distribution in calm wind conditions. Like all spray irrigation, large spraying distances can result in water loss through evaporation and wind drift.

Gear Drive Sprinklers

Recommended Application: Lawn ✔ Garden Beds ✕

Gear drive sprinklers operate via water driven gears and usually require more water pressure to operate than rotary, spray or drip irrigation types. Gear drive sprinklers are vulnerable to water loss from wind drift and evaporation.

Drip Irrigation

Recommended Application: Lawn ✕ Garden Beds ✔

Drip irrigation is the most effective, water efficient means of irrigation available. Drip irrigation applies water on the ground and close to the root zone, effectively eliminating water loss due to overspray and wind drift. It can be mulched over, which further reduces the potential water loss through evaporation.

Micro Spray Irrigation

Not Recommended

Whilst micro sprays are inexpensive and easy to install, they have a number of disadvantages including higher maintenance requirements due to the spray heads clogging up, are quite easily damaged or vandalised, distribute a reduced, uneven spray pattern due to the fine droplet size, and lose a significant proportion of irrigation water due to wind drift and misting. These types of systems are not recommended.

Sprinkler head types have different precipitation rates and distribution areas. To ensure accurate, effective and uniform distribution across your garden you need to ensure sprinkler heads (or drip emitters) are all of a consistent type, size and model.

Recommended Watering Times

The table below highlights the recommended watering times for the Geographe Bay that should be programmed for each hydrozone. Refer to Page 7 for information on hydrozones.

The plant selection and the sprinkler type in each of these hydrozone areas will determine the watering run times. 'High resource needs' hydrozone areas require an application of 10mm per watering day, the 'medium resource needs' zones receiving slightly less water application per watering day and 'low resource needs' hydrozones often require no irrigation.

Hydro-zone Type	Treatment	Sprinkler Type	Typical watering rate (mm per hour)	Recommended Irrigation Run Times (mins)				
				SUMMER Dec - Feb	AUTUMN Mar -May	1st of JUNE WINTER SPRINKLER BAN BEGINS	WINTER June-Aug	31st of AUGUST WINTER SPRINKLER BAN ENDS / SPRING Sept-Nov
Seasonal Adjustment on Irrigation Controllers				100% water budget	75% water budget		N/A	75% water budget
High Resource Needs	Planting Beds	Fixed spray	35-45	13-17	10-13		SYSTEM OFF	10-13
		Rotary	10-15	40-60	30-45			30-45
		Gear Drive Rotator	10-20	30-60	23-45			23-45
		Drip line	15-20	30-40	23-30			23-30
	Lawn Areas	Fixed spray	35-45	13-17	10-13			10-13
		Rotary	10-15	40-60	30-45			30-45
		Gear Drive Rotator	10-20	30-60	23-45			23-45
Medium Resource Needs	Planting Beds	Fixed spray	35-45	10-13	8-10			8-10
		Rotary	10-15	30-45	23-34			23-45
		Gear Drive Rotator	10-20	23-45	17-34			17-34
		Drip line	15-20	23-30	17-23			17-23
Low Resource Needs	Planting Beds	No irriga-tion	None	SYSTEM OFF	SYSTEM OFF			SYSTEM OFF

The table above is sourced from Water Corporation.

For properties with Scheme Water refer to Busselton Water/Water Corporation Rostered Watering Days. As of March 2014, between the 1st of September and 31st of May you can irrigate your property two days per week before 9am and after 6pm.

For properties with Bore Water refer to the Department of Water Domestic Garden Bores for the South West Area (Area 4). As of March 2014, between 1st of September and 31st of May bore users can irrigate any day of the week before 9am and after 6pm, but are encouraged to limit watering to 2 days per week.

For all properties there is a complete winter sprinkler ban between the 1st of June and the 31st of August.

Support Local Biodiversity

incorporate local, native plant species

A great resource for sourcing local native plants is the South West Catchments Council's (SWCC) ***"Coastal Gardens – A Planting Guide for Geographe Bay - Bunker Bay to Dalyellup"***. It includes a list of suitable local native groundcovers, shrubs and trees as well as highlighting the common weeds found in the area.

The Australian Weed Committee's weed identification website (www.weeds.org.au) is a great resource to assist homeowners to identify weeds that may be present on their property.

The Geographe Community Landcare Nursery (http://geographelandcarenursery.mysouthwest.com.au/) has an incredible range of local native trees and shrubs available.


frog friendly garden


Peppermint Tree


Baudin's cockatoo

encourage biodiversity

Increase the Diversity of Plants

By incorporating a variety of plant species within your garden, you will achieve a greater range of habitats to attract local fauna. Native habitat trees including *Eucalyptus sp., Melaleuca sp.* and *Agonis sp.* provide great habitats for native fauna including the Western Ringtail Possum, Tawny Frogmouth Owl, Baudin's Cockatoo, Red-tailed Black Cockatoo and microbats. Native trees also require less water and fertiliser because they are better suited to the local environmental conditions.

Minimise Hard Surfaces

Consider replacing any under-utilised hard surface areas such as the spaces between the boundary and your house or even within the driveway with garden beds. By reducing the amount of hard surfaces in your property to around 30% of your property's total area (excluding the house and other structures) you will:

- Reduce the amount of stormwater runoff and increasing the natural infiltration into the groundwater
- Increase the local biodiversity and micro-organism activity in the soil
- Reduce the effect of heat absorption caused by an area of hard surfacing

Consider replacing impermeable surfaces with crushed gravel, mulch or permeable paving to allow stormwater to infiltrate locally replenishing groundwater and help to reduce the amount of polluted water entering stormwater drainage systems, through run off.

Support Local Biodiversity

encourage biodiversity

Create Fauna Habitats

There are several simple features that can be included in your garden that will provide great habitat for local wildlife. These could include;

The Western Ringtail Possum is a threatened species and Busselton and Dunsborough urban areas support one of the last major populations of Ringtails. Refer to the GeoCatch website for more information.

- Establishing a frog friendly garden by installing a lined frog pond surrounded by native local rushes and sedges, as well as rocks and logs
- Randomly placing old logs and rocks for reptiles and insects
- Creating a native verge garden to act as an attractant for local fauna
- Installing bird, possum and bat nesting boxes within existing mature trees
- Providing clean, fresh water for wildlife
- Keeping domestic pets indoors during the night to prevent injury or death to local fauna in particular the Western Ringtail Possum.
- Consider incorporating multi-layered vegetation to create a range of habitats for animals


water for wildlife


western ringtail possum


garden hygiene

attract beneficial insects

Managing Pests and Diseases

There are a number of **natural, organic, biological and non toxic alternatives.** These are available either on the market or as home made remedies such as fruit fly traps, milk sprays, bird netting and possum barriers. For more information on home made remedies go to www.greenharvest.com.au. It is also worth considering:

- Installing a frog pond which can help to keep slugs and snails under control and in time attract skinks and lizards which control insects like beetles, ants and grasshoppers
- Adopting crop rotation in your productive garden
- Maintaining good general garden hygiene
- Growing plants which attract beneficial insects such as flowering parsley

Chemical pesticides are not recommended as they can reduce biodiversity and the number of beneficial insects in your garden. They can also be harmful to humans and pets and leach into adjacent waterways adversely affecting the local aquatic ecosystem.

To avoid pesticides leaching into waterways it is important to follow instructions and the application rates.

Disposing of Pesticides

It is important that you dispose of pesticides correctly. Chemical pesticides are toxic and can interfere with the operation of wastewater treatment systems and harm aquatic life in local waterways. The Busselton City Council has days where you can leave your unwanted hazardous substances at the Busselton Waste Transfer Station. Do not pour left over pesticides down the sink, sewer or street drain.

BAY OK

A GeoCatch Project

"A healthy bay begins in your own backyard"



GeoCatch
The Environment - in Our Hands
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