KidsGrow

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Australian Habitat Haven

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Suggested age 7-8 years

Stage 1 (NSW)
Suite 1/Level 2 (QLD)
Level 2 (VIC)
Standard 1 (SA/TAS)
Later Childhood (ACT)
Early Childhood (WA)
Band 1 (NT)

Australian Habitat Haven to attract insects, frogs and lizards

Survival of individual species of animals and plants depends on the health of the habitat in which they live. The primary cause of species extinction is loss of their habitat. If there isn't a place to live, life cannot occur.

Habitat is the place where plants, animals and other organisms live. Every part of the school grounds is habitat – from the "cracks in the path to the crown of the tallest tree." However, areas with local native plants will attract more native animals. One large tussock of native poa grass can be home to almost a thousand visible invertebrates. Local native plants are also good to grow because they are well adapted to local climates, soils and conditions. The basic requirements for attracting native fauna to a garden are food, water, shelter, nesting materials, safe places to raise young and closeness to other similar areas.

Biodiversity refers to the variety of plants, animals, variety of ecosystems and the variety of genes in every species. Insects account for more than 80% of Australia's biodiversity and have important roles as pollinators and as food for other animals. If possible try to incorporate your Habitat Haven as part of an existing or proposed wildlife corridor or develop an environmentally degraded area of the school which desperately needs improving. Start by choosing a size which is manageable and then the Habitat Haven can be extended in the future by other classes.

Student outcomes:

In creating this Australian Habitat Haven students will:

- understand that all living things depend on Earth and its environment.
- compare and contrast natural and built features in the local area and the ways in which living things interact with these features.
- conduct investigations by observing, questioning, predicting, testing, collecting, recording, analysing data and drawing conclusions.
- develop and evaluate ideas using drawings, models, prototypes and examples at appropriate stages of the design process, then implement them.
- identify and describe ways in which living things grow and change and recognise how environments change over time.
- recognise that they can have a positive impact on the environment and adopt behaviours and practices that help to protect the environment.
- distinguish between indigenous, native and introduced plants.
- identify threats to biodiversity such as weeds.

KidsGrow resources

- *Steps for creating a Habitat Haven*
- *Australian Habitat Haven sample design*
- *Habitat Haven tips and plant suggestions*
- *Who can live here? Habitat site audit worksheet*
- *Steps for making a native habitat pond*

Other resources from *www.kidsgrow.com.au*

- *Safety tips for learning outdoors*
- *School friendly gardening practices*
- *Waterwise gardening*

Composting. Compost will enrich your garden and make it grow. Composting is nature's way of recycling. Almost any organic matter can be composted including leaves, straw, food scraps, lawn and garden clippings. You can build your own from timber, bricks or other materials or just make a heap. For fact sheets go to *www.abc.net.au/gardening* and type in *'compost'* in the SEARCH box.

Be Wise About Water. With simple planning and good plant selection you can create a beautiful water efficient garden right from the start. Check out *www.wiseaboutwater.com.au* for detailed tips on reducing water use and links to other useful websites.

Your local nursery or garden centre is a great place to start for advice on gardening techniques, garden supplies, landscape suppliers and plants suitable for your area.

NGIA thanks Learnscapes Planning & Design for sharing their process in the creation of this themed garden.

Steps for creating a Habitat Haven

ACTIVITIES TO BE UNDERTAKEN	STUDENT LEARNING OPPORTUNITIES

Step 1. Organise your team and create a vision for your garden

Research local ecosystems and native habitats. Set up a habitat garden team to include parents. Tap into community resources and expertise. Choose the types of native habitat which could feasibly be developed in the school grounds. Research the needs of the species of fauna suited to the type of habitats being considered. Consult with the principal and relevant school staff to discuss any additional requirements. Refer to the *'Australian Habitat Haven sample design'* and the *'Habitat Haven tips and plant suggestions'*. Develop a wish list of ideas and elements to be incorporated. Be sure to include sources of food, water, shelter and nesting materials.

Discuss the rationale for maintaining or creating school native habitat areas. **Debate** which native creatures to encourage. **Contact** and **invite** local experts to join your Habitat Haven team or to assist with research and planning your restoration project. **Visit** or **research** a natural ecosystem similar to the one originally in the school grounds. **Identify** and **record** the plant species and soil types. Photos and samples will assist. **Discuss** and **list** any features that could be replicated in your school habitat garden. **Investigate** the life cycles and changing habitat needs of frogs. **Select** other local native animals and identify their specific habitat needs – food, water, cover and places to raise their young. **Find** where the suggested elements are located on the sample Australian Habitat Haven design. **Brainstorm** fundraising ideas for your garden. **Act** on these.

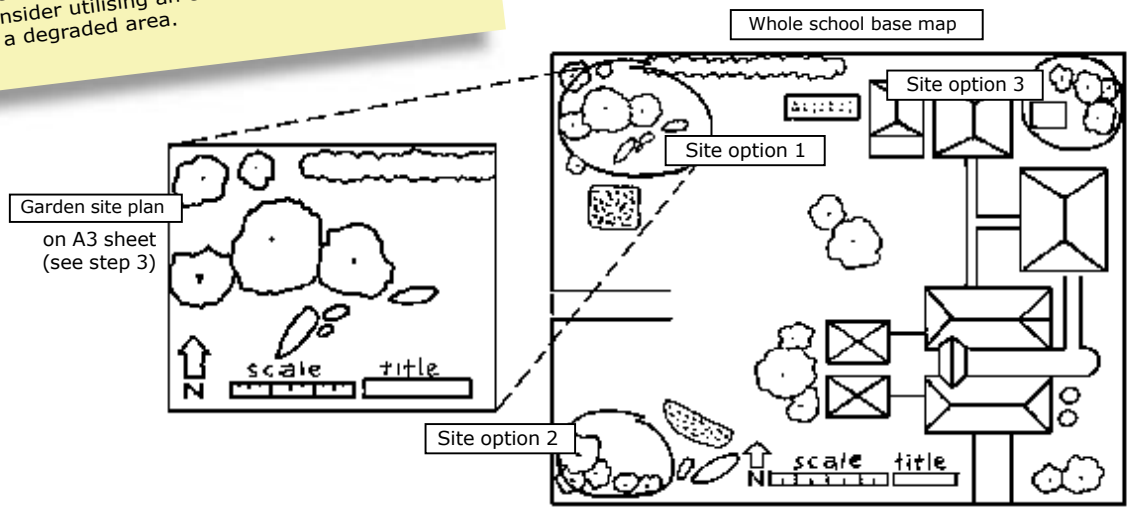
Step 2. Locate the best place for the garden

Assess the grounds by conducting a site audit. Consider:

- ☐ Location of buildings and physical features
- ☐ Location of service lines e.g. water, electricity
- ☐ Existing vegetation including weeds
- ☐ Existing animals and evidence of habitat
- ☐ Sunlight and shade at different times
- ☐ Soil quality and type
- ☐ Prevailing winds and climatic influences
- ☐ Slope and drainage run-off patterns
- ☐ Current functions of areas and supervision
- ☐ Vehicle and pedestrian access
- ☐ Views and visual quality
- ☐ Hazards, safety and maintenance issues
- ☐ Environmentally degraded areas
- ☐ Imminent changes affecting the site

Then select an appropriate garden site. Consider utilising an existing wildlife corridor or a degraded area.

Locate or **create** a base map of the existing school grounds. **Collect** and **record** relevant site data onto copies of the base map. **Identify** any areas of remnant vegetation. **Record** on a base map. **Observe** water flow and pooling during rain. **Map** your findings. **Look** around the grounds for signs of fauna (insects, birds, water creatures, mammals, lizards, butterflies etc.) and their habitats. **Determine** the number of habitats your school grounds contain. **Mark** in each habitat area on a base map by drawing a bubble around it. **Record** the plants and animals in each habitat area on the *'Who can live here? Habitat site audit summary'.* **Write** an information report about the biodiversity you've found. **Record** all data on a chart and **display** it for the whole school. **Assess** the best places for your Habitat Haven using information collected in the site audit. **Select** which part to develop first. **Discuss** and then **decide** what habitat type best fits the conditions of your site, your budget, your vision and purpose. **Assess** whether your garden project will be an improvement of an existing habitat or the creation of a new habitat. **Photograph** your chosen site at different times and after rain.



ACTIVITIES TO BE UNDERTAKEN	STUDENT LEARNING OPPORTUNITIES

Step 3. Create the garden design

The Habitat Haven site should provide potential habitat for at least six different species. Select a specific part of this site for your project. An area of 15 - 20 square metres planting is manageable. A little more may be needed to include a pond or bog. Create a site plan for the proposed garden area. 1:25 is a good scale for students to draw their design ideas. (4cm on plan = 1 metre on ground). Mark in any existing features including trees. Collaboratively decide the details of the design. Identify human influences affecting your site (e.g. foot traffic) and plan to minimise these.
Select vegetation for all levels - canopy, shrubs, ground cover and native grasses. Bob Winters (Gould League)* suggests at least two grasses per square metre are required, with more than 60% poas or danthonias. Incorporate patches of kangaroo grass and select wildflowers easily distinguished from weeds. Draw up the final design. Seek expert feedback.

Mark out the approximate area where the garden will be located.
List the elements that must be included in your habitat haven
Imagine what the area may look like after it is built and planted.
Individually **think** about and **draw** what your garden may look like.
Present each drawing and **describe** individual ideas to the class.
Select and **list** any additional, non-essential design elements.
Decide on the garden shape and size and the location of pathways.
Decide what types of structures (if any) need to be built e.g. pond, mounds, pathways, boardwalks, bridges, seating, outdoor classroom.
Consider all ideas when developing a draft Habitat Haven design.
Decide how to provide ongoing water for the animals and insects.
Include all elements in the garden design. **Draw** onto a site plan.
Decide what to plant and where. **Refer** to the *'Habitat Haven tips and plant suggestions'.* **Seek** expert advice through your local council or Greening Australia. **Record** plant choices on your design.
Display the garden design for school community feedback.
Calculate the numbers of each type of plant needed.
Compile a list of materials required to develop the garden site.
Investigate local suppliers and **write** letters to ask for prices.
Calculate the cost of buying plants and materials. **Write** a request asking for donations of materials in the school newsletter.

Step 4. Lay out the garden

Using ropes and pegs or marking agent set out features from the class design on the ground. Reassess the design to ensure that it will work. At each stage of development take photographs of the garden and the students' involvement.

Mark out the planned garden boundary and then the actual location of the site for a pond or bog, outdoor seating area and any other features to be included. **Use** small branches to define a pathway.
Determine the size, shape and depth of any water bodies.
Write captions for the photos. **Use in a class display** or big book.

Step 5. Build garden structures

Call on support networks and helpers to assist in building the garden. Develop a basic action plan.
Remove existing unsuitable plants including lawn. Take care not to disturb any effective habitats.
In some situations asphalt may need removing.
Construct pond, access pathway, seating area.
Use excavated soil to form undulating mounds.
Implement soil erosion prevention strategies.

Refer to *'Steps for making a native habit pond'* and make sure to **plan** for any necessary elements and requirements.
Publicise in the school newsletter appreciation of any donations.
Organise a working bee. **Invite** people to help build the garden.
Compile a list of jobs to be done and tools needed.
Compile a set of safety precautions for students and helpers.
Write a thankyou letter to everyone who helped build the garden.
Prepare a report or display about your project for parents.

Step 6. Prepare the soil

Different plants like different soil types so it is a good idea to test your soil.
A pH test kit is inexpensive and available from your local retail nursery or garden centre

Rock hard ground can be difficult to dig. Only dig if necessary. Rotary hoeing will loosen the soil but could spread unwanted weed seed. After hoeing break the lower soil layer with a crowbar to avoid future waterlogging. Adjust soil properties if necessary. The area needs to be well mulched before planting to help retain moisture and slow down weeds and erosion.

Choose local plants adapted to the soil types found on the site.
Add well rotted manure or other organic fertiliser if required.
Find out about the best type of mulch to use**.**
Seek advice from your local retail nursery or garden centre.
Cover the whole garden area with mulch to a depth of 7-10cm.
Remove weeds carefully, one species at a time. This enables student weeders to focus on identifying and removing one weed species at a time. **Use** undiseased weeds for compost.

ACTIVITIES TO BE UNDERTAKEN	STUDENT LEARNING OPPORTUNITIES
Step 7. Plant the garden	
Plants should be purchased ahead of time. Tube stock is preferable as they grow faster, have a better chance of growing stronger root systems and are cheaper. Someone with some planting expertise and able to read the garden design should assist the students to set out the plants. Demonstrate to students how to plant seedlings. Be careful not to plant too close to paths and not to plant trees under other trees or powerlines. Don't have too many people working at once. Mark plants with sticks to keep them safe.	**Gather** all required equipment - gloves, buckets, trowels, rulers. **Water** the plants in the tubes or pots so they are well soaked. **Help** place the plants on top of the mulch in position for planting. Be systematic starting from one side of the site and working to the other. To plant, **scrape** away the mulch to form a hollow and **expose** the ground to a size of 15cm diameter. **Dig** a hole a little deeper than the pot and twice as wide. Don't mix mulch with soil. **Remove** the moistened plant from the container by squeezing and holding it up-side down. **Place** in the hole. **Pack** the soil gently around the plant. **Water** each plant with at least half a bucket of water applied in a gentle sprinkle
Step 8. Tend the garden	
Research chemical free care for the garden. See *'School friendly gardening practices'.* Create an ongoing maintenance and watering plan. Ensure that the boundaries are defined so the area is not mowed. Keep the area, including pathways, well mulched.	**Provide** rocks or logs for lizards to sun themselves. **Prepare** a job roster and **delegate** roles and responsibilities. **Use** the internet and other sources to learn about organic garden care. **Visit** your garden daily. **Record** observations in a class journal. **Measure** and **graph** the growth of selected plants over time.
Step 9. Celebrate and share the garden	
Document the progress of your garden. Habitat Haven signage should publicise that this place is special and why. Plan a celebration as part of a special environmental day or school assembly. Prepare a related arts performance.	**Maintain** a journal of actions and observations. **Design** and **create** a special sign for your Habitat Haven. **Invite** everyone to join a celebration for your new garden. **Create** a Habitat Haven map and field guide which describes the plants and visiting wildlife. **Add** to this as the area is expanded.
Step 10. Keep your garden going	
Incorporate the maintenance activities into your curriculum plan. Devise a maintenance schedule. Monitor the garden and keep it weeded regularly. In the pond, overcrowded water plants benefit from division and replanting in spring. In autumn it's best to remove dead foliage that might pollute the water. Rake out most of the leaves that fall in. Apart from that, ponds are very low maintenance, although it is worth giving them a clean out every second year.	**Observe** life cycles, habitat changes and wildlife. **Take** photos. **Renew** mulch. **Maintain** environmental health and habitat supports such as nesting materials. **Study** insect populations over time. **Observe** and **record** which plants attract which insects. **Predict** the factors which affect insect population size. **Check**. **Identify** native host plants for butterflies. **Add** to your garden. **Plan** additions and improvements to suggest for the next year. **Graph** the results of ongoing habitat observations, such as the number of various species seen in a day, a month and year. **Deposit** maps, designs and information collected in the library.
Hand your garden on to a younger class at the end of the year.	

Going Further

Research habitat needs for other wildlife including birds and butterflies.
Design and construct bird and possum boxes and place strategically in your habitat area.
Share your before and after photos and any interesting wildlife observations at *www.kidsgrow.com.au*

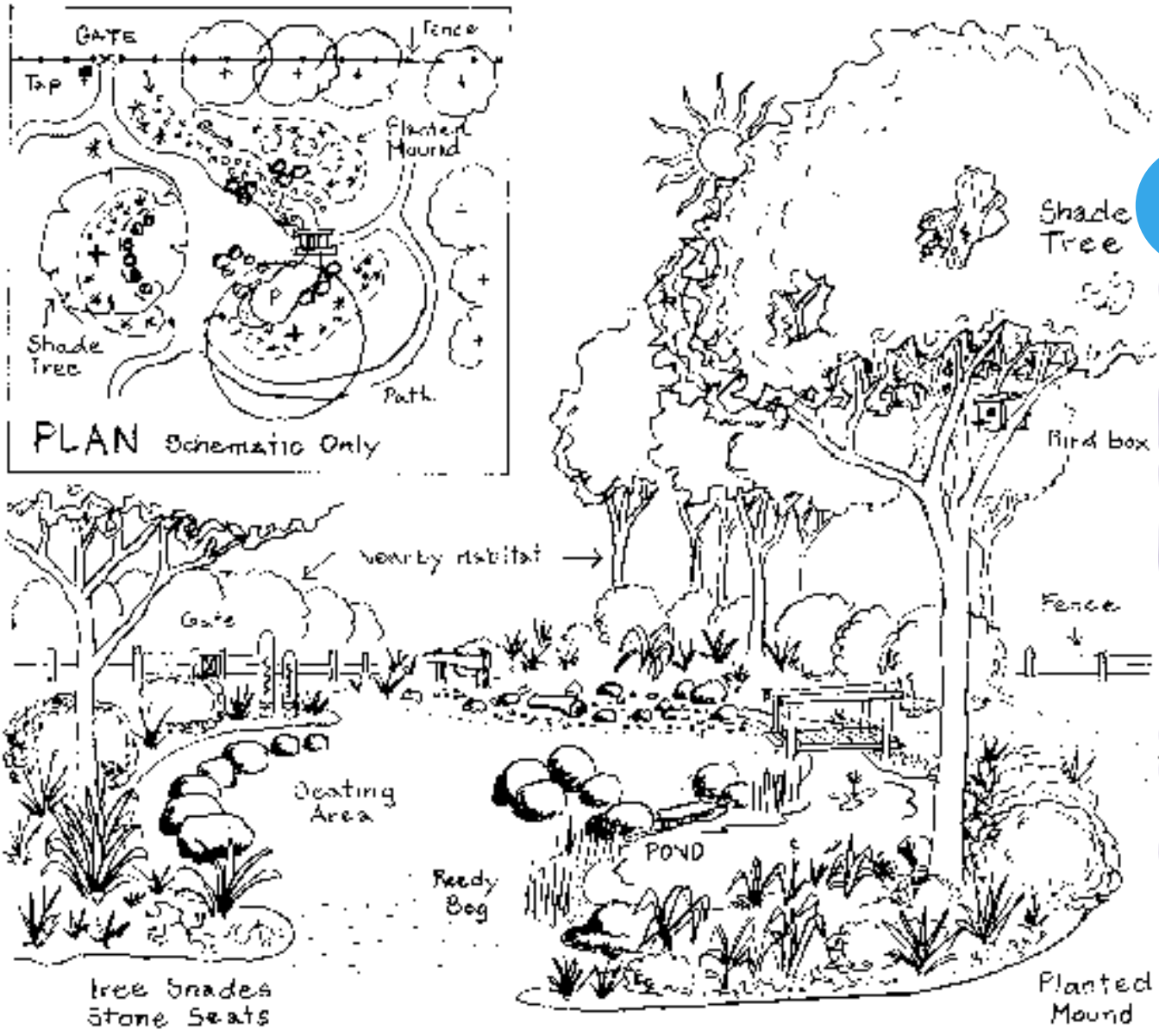
Useful websites

www.floraforfauna.com.au for habitat garden planning and design*;*
www.frogs.org.au ; www.sgonline.org.au ; www.wwf.org.au ;
www.wildscapes.com.au ; www.organic ; www.nccnsw.org.au (Australian Community Biodiversity Network)
www.gould.edu.au for a wildscapes landscapes planner
www.deh.gov.au/biodiversity/threatened/ts-day/habitat ; www.latrobe.edu.au/wildlife
www.greeningaustralia.org.au Look under each state for relevant information - Qld, SA and NT have great schools resources. Go to 'Tips and Tools' in left-hand menu and look under 'Publications'.

Useful resource

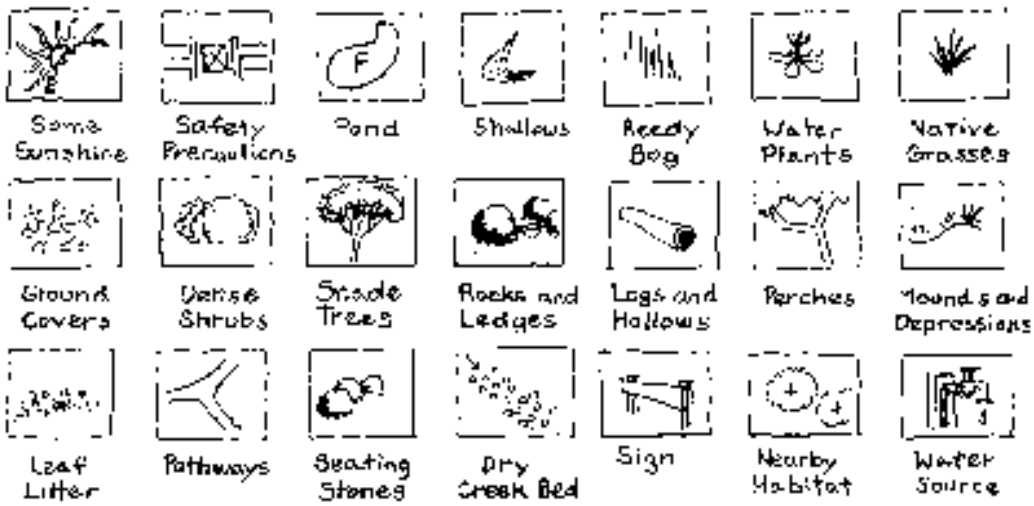
**Exploring Biodiversity,* Bob Winters, 2001, Australian Science Teachers Association. Available from the Gould League, Victoria

Australian Habitat Haven sample design



PERSPECTIVE SKETCH of HABITAT HAVEN

KEY



Learnscapes Planning and Design
John Webber and Helen Tyas Tunggal

Habitat Haven tips and plant suggestions

Top tips

Favour local plants, mimic nature, maintain a constant water supply, manage pests and disease naturally and look after your wildlife habitat.

Essential elements of a habitat garden

Habitat gardens should favour local plants in order to restore, protect or recreate the kind of habitat and biodiversity that once occupied that land before European settlement.

Food. Locally growing native indigenous plants are the basis for the natural food chain in any given ecosystem. Plant appropriate vegetation to supply as much year round food as possible to local wildlife (nectar, seed, berries, insects).

Water. Throughout the year wildlife needs water for drinking, bathing and in some cases breeding. Butterflies, birds and frogs often prefer to use shallow, puddle-like water sources.
See *'Steps for building a native habitat pond'.*

Shelter. Include rocks, stones and logs in various stages of decay, to provide shelter (don't take these from the bush). Plants with dense, prickly foliage will provide protection from cats and other predators, especially at nesting time.

Nesting materials. Knowing the nesting needs of creatures in your area will help you provide the kinds of foliage and nesting materials and physical spaces they want. Provide tree hollows, twigs and native grasses for nests.

Nearness to similar areas. Locating your Habitat Haven in the vicinity of existing habitat can potentially extend wildlife corridors.

Undulation. Utilise water run-off for the pond or bog area. Create shallow mounds and hollows for planting grasses.

Earth friendly gardening practices. Use appropriate methods to fertilise plants and deal with weeds and pests.

Plants with a range of height. Include plants from ground covers to tall shrubs. See table below. Check with your local garden centre, council or native plant group for plants suitable to your area, ensuring that none are weeds.

Height	**Type of plant** *(choose only if occurring naturally in your area)*	**Spacing** *(for a ten square metre plot)*
Tall	**Eucalypt** to provide some canopy and perches	One canopy tree
Medium	Bottle brush, banksia, wattle, blueberry ash, lilly pilly, kangaroo apple, casuarina, acacia, melaleuca	Two small trees for mid-storey canopy
	Dense/prickly foliage e.g. hakea, grevillea, olearia, *Pomaderris aspera*	Four to six small dense shrubs clumped together
Low	**Native and indigenous grasses and sedges e.g**. poa, wallaby grass, kangaroo grass, juncus, *Restio tretraphyllus, Dianella tasmanica*, wildflowers, prostrate grevilleas	At least 12 – 16 grasses arranged in clumps (two per square metre) 60% poas and danthonias
Ground cover	**Native ground covers e.g.** brachyscome, *Schleranthus biflorus, Viola hederacea,* chrysocephalum, *Myoporum parvifolium, Dichondra repens, Clematis aristata*, scaevola	Make sure any bare ground is covered with either ground cover or mulch.
Pond plants*	**Water plants e.g.** nardoo *(Marsilea drummondii)*, elodea, vallisneria, *Ranunculus innundatus,* indigenous water lilies (if > 30cm deep) **Marginal bog e.g.** lomandra (not in WA), restio, ferns, tussock sedge (use indigenous *Carex* species)	Keep two thirds of the pond surface clear of plants. At least two each of five different species.

**Aquatic plants can become very invasive. Use only those species which occur naturally in your area.*

Habitat pond needs

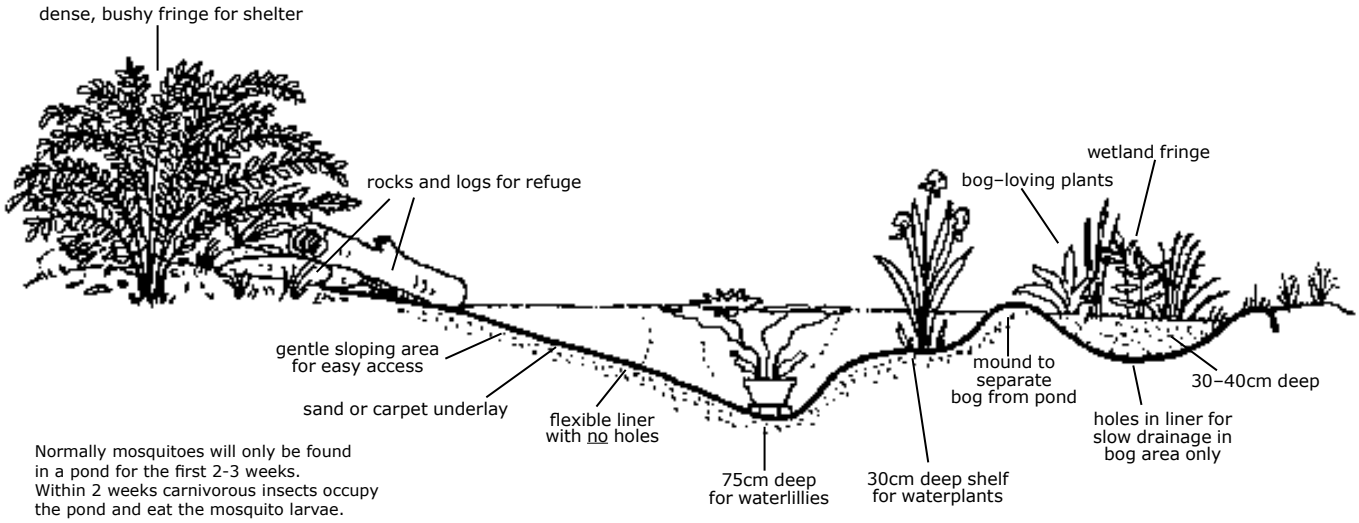
- A variety of depths so pond dwellers can escape from heat and predators.
- Morning sun to warm the water all up and afternoon shade to keep it all cool.
- Shallow and boggy edges as well as a rock, log or refuge island in the middle.
- Water plants for hiding in, feeding on and in, and to help keep the water clean.
- Overhanging rocks, vegetation or logs on edges to shelter small vulnerable creatures.
- Dense indigenous grasses and shrubs along the part of the pond edge for refuge and food supply.

Note: Do not add fish to the pond and do not have a fountain.

Steps for making a native habitat pond

Ask your local garden centre for expert advice

1. **Investigate safety management of ponds in other schools.** Strategies include installing a metal grill under the water surface; locating ponds in a well fenced off 'natural area'; placing them in a high use, high visibility area; or only having a very shallow frog bog.
2. **Check local council and departmental requirements before planning construction.** These are usually easy to follow regulations regarding the size, depth and location of school ground water features.
3. **Observe the direction of water flow** on the school site preferably during and after rains. The ideal location for the pond may be where run-off naturally accumulates on the grounds. Down pipe water could also be utilised. Ensure that the pond site will not receive excess nutrients from run-off.
4. **Select a location** after considering the *'Who can live here? Habitat site audit summary'*. Food, water, shelter, nesting materials, protection from predators and proximity to other similar areas are the basic requirements for attracting fauna.
5. **Prepare a design.** An average depth of 30cm will be suitable for water creatures. If the ground is sloping a linked series of smaller ponds may be more suitable. Plan for an irregular 'shoreline' with various habitat coves and a gradually sloping beach for easy access by amphibians and other wildlife. An overflow 'wetland' area next to the pond for excess rainwater supports additional plants and wildlife to study.
6. **Consider construction options** which include using a commercially available flexible liner, concrete or a thick layer of compacted clay. Seek advice from your local nursery or pond expert. If using concrete, it may need to be waterproofed and leach proofed. Unless the clay is naturally occurring a liner is probably the best option.
7. **Dig out the pond shape** making sure the edges of the pond are level. Use the soil to create mounds and undulations near the pond. Before laying the liner, pad the hole with sand or old carpet. Check for any added chemicals in the local water supply before filling with water. Neutraliser may be necessary. Chlorine will dissipate in a week.
8. **Fill the pond with water.** Place plenty of rocks and tree branches in the pond as habitat and climbing places for wildlife. For a healthy pond add a bucket of water from a nearby pond. Don't stock the pond with fish. Wildlife will eventually find the pond on their own. (Do not put in a fountain).
9. **Select appropriate indigenous aquatic plants.** Refer to *'Australian Habitat Haven tips and plant suggestions'*. Some should float while others grow tall out of the water. (Water lilies provide good habitat but require deeper water). Plant dense native grasses and shrubs along the edge for refuge and food supply. Seek the advice of a specialist for example through Landcare, Greening Australia or your local council.
10. **Implement safety precautions.** Create a 'boundary' around the pond with a low fence, log seating or large rocks. Educate students about potential risks. Reinforce this in the school community newsletter and strategically placed student designed signage.



Who can live here ? Habitat site audit summary

Select a variety of sites in the school grounds and assess their ability to support wildlife.

Location 1.

_____

_____

_____

- Are there human activities on this site? _____
- Are these activities compatible with native animals in the area? _____
- Do native animals already live on this site? _____
- Can the site be easily improved for these animals? _____

PLANTS							ANIMALS				
Describe the location and its characteristics	Identify local native vegetation				Non-native	Weeds	Who lives here now?	Identify existing habitat needs provided by this site			
	Trees	Shrubs	Ground covers	Grasses				Food	Water	Safe shelter	Places for young

